

**BADGER STATE**

# Smoke Signals

**For Radio Amateurs • By Radio Amateurs**

**Published Monthly Since 1969 • Our 21st Year • Single Copy: \$1**

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**Vol. 21 No. 3 - 243rd Consecutive Monthly Issue - Baraboo, Wisconsin - March 1990**

## AstroHam

Astronaut Ron Parise, WA4SIR, pictured at right, a NASA Payload Specialist, has been authorized by NASA to operate voice and packet radio during a flight aboard Space Shuttle Columbia in May. Westlink Report, in its Feb. 16 edition, says STS-35, a ten-day mission, has been rescheduled for launch on May 9, 1990, and STS-37, with Ken Cameron, KB5AWP, as shuttle pilot, has been moved from early June to Nov. 1. Full information is on page 10 of the February, 1990, issue of Badger State Smoke Signals.

- NASA photo



## FCC Proposes Codeless Amateur License See page 15

## ARRL Board Adopts Budget

The ARRL Board of Directors met in Hartford January 19-20 to consider reports of its officers and committees, elect officers for two-year terms, and conduct the other business of the League. The Board regularly meets twice a year, in January and July.

As reported elsewhere, the Board declared 1990 "The Year of the Amateur Satellite Program" in recognition of the many important space-related events expected to occur this year. Other actions included ordering continued preparation for the 1992 World Administrative Radio Conference, and continued study of improved methods of spectrum management in Amateur Radio.

A 1990 budget for ARRL was approved that anticipates more than \$9.7 million in revenues and expenses for the year. For

(Please turn to page 16)

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### ELMER

PLENTY OF  
LOGS... JUST A  
FEW SECONDS...



CQ WISCONSIN  
QSO PARTY...



HEY!  
THAT WAS  
YESTERDAY!



WHO CHANGED  
IT TO A  
SATURDAY?!



by Rich Regent, K9GDF



## Swapfests and other Social Events

**SUNDAY, MARCH 11, 1990.** Sterling IL, Hamfest.

**SUNDAY, MARCH 25, 1990.** Lamarsfest at Grayslake, IL. Contact: Lamars, Box 751, Libertyville, IL 60048.

**SATURDAY, MARCH 31, 1990.** Rockford Hamfest 90, held at Teamsters' Hall, 5533-11th St., (highway 251S), Rockford, IL. Contact: Rockford Amateur Radio Association, P.O. Box 10003, Rockford, IL 61131.

**SUNDAY, APRIL 8, 1990.** Madison swapfest sponsored by the Madison Area Repeater Association at the Dane County Expo Center, Forum Building, Madison WI. Contact: MARA, P.O. box 8890, Madison, WI 53708-8890. (608)-249-7579 (see ad last page.)

**SATURDAY, MAY 5, 1990.** The Twelfth Annual Swapfest of the Ozaukee Radio Club will be held at the Circle B Recreation Center in Cedarburg, WI. Contact: ORC Swap, N5415 Crystal Springs Ct., Fredonia, WI 53021. (414) 692-2329

**SATURDAY, MAY 12, 1990.** Swapfest 1990, sponsored by the Tri County ARC, at the Jefferson County Fairgrounds, Highway 18 West, Jefferson, WI. Contact: Tri County ARC, P.O. Box 112, Jefferson, WI 53449. (see next month BSSS for more details.000000

**SATURDAY, MAY 12, 1990.** Lakeshore Hamfest, Manitowoc, WI sponsored by Mancorad Radio Club. Manitowoc County Expo, intersection of hwy 42-151 and I-43 on county hwy "R", follow signs to center. Contact: Mancorad Radio Club, P.O. Box 204, Manitowoc, WI 54221-0204. Call "Red" (414) 684-9097 (days) or "Lou" (414) 682-2557 (nights).

**JUNE 8-10, 1990.** ARRL National Convention, Kansas City, MO.

**SATURDAY, JUNE 17, 1990.** The Central Wisconsin Radio Amateurs will hold their annual Swapfest at the University Center on the UW-Stevens Point Campus in Stevens Point, WI. Morning and afternoon ARRL/VEC exam sessions, Seminars, tables and power available for commercial vendors. Contact: Art Wysocki, N9BCA, 3356 April Lane, Stevens Point, WI 54481.

**SATURDAY, JULY 7, 1990.** South Milwaukee ARC Swapfest at the American Legion Park, Shepard Ave., Oak Creek, WI. Contact: SMARC, P.O. Box 102, Milwaukee, WI 53172. (see ad last page.)

As a service to our readers, this section of Badger State Smoke Signals is available without charge to list your upcoming Swapfest, Hamfest, dinner, picnic, party or other event of interest to Radio Amateurs in Wisconsin and nearby areas.

Send information on your event to Kenneth A. Ebnetter, K9EN, 822 Wauona Trail, Portage, WI 53901. In addition, space is available at attractive rates on our advertising pages. For information on rates and requirements for our advertising pages, please contact K9ZZ or K9EN.

## Club Meetings

### BADGER AMATEUR RADIO SOCIETY

(W9YT - UNIVERSITY OF WISCONSIN - MADISON)

Monthly while school in session - 2nd Wednesday - 7:30 p.m. - B-314, Electrical Engineering Building.

### CENTRAL WISCONSIN RADIO AMATEURS, LTD.

(STEVENS POINT)

Second Wednesday.

### EAU CLAIRE AMATEUR RADIO CLUB

2nd Tuesday - 7:30 p.m. - Parks and Recreation Bldg., Oxford and 1st Streets, Eau Claire. Hams,

guests welcome. Travelers welcome on wide area club repeater K9UXP, 146.31/91.

**FOUR LAKES AMATEUR RADIO CLUB (MADISON WI)**  
First and third Tuesdays - 7:30 p.m. - Red Cross Bldg., 4860 Sheboygan Ave.

**FOX CITIES AMATEUR RADIO CLUB**  
Third Monday - 7:00 p.m. - Roosevelt Jr. High School, 318 E. Brewster St., Appleton. Info: (414) 766-3886.

**GREATER MILWAUKEE DX ASSOCIATION**  
Fourth Monday of the month at 7:30 p.m. Contact Jerry Scherckenbach, N9AW, at (414) 481-8831 for meeting location.

**GREEN BAY MIKE AND KEY CLUB**  
Second Thursday - Red Cross Bldg., corner Danz and Deckner, Green Bay.

**GREEN FOX AMATEUR RADIO CLUB**  
Third Monday - 7:30 p.m. - Green Lake Town Hall, int. of county hwy. K and N.

**KETTLE MORaine RADIO AMATEURS**  
Second Friday, 7:30 p.m. at the Waukesha County Technical College, Campus Science Building, Room 102. Talk-in on the N9KS 147.39 repeater.

**LAKESHORE RPTR. ASSN.**  
Last Tuesday, Jan., Apr., Jul., & Oct., 7:30 p.m. Red Cross Bldg., 4521 Taylor Ave., Racine, WI.

**MADISON AREA REPEATER ASSOCIATION**  
1990 meeting dates: Mondays March 12, September 10, & November 12.

**MANITOWOC COUNTY RADIO AMATEURS**  
Directors Meeting: First Wednesday.  
General meeting: Second Wednesday.  
Both meetings held at 7:30 p.m. in the basement, Manitowoc City Hall, 817 Franklin St., Manitowoc.

**MENOMONEE FALLS AMATEUR RADIO CLUB**  
Last Tuesday - Doors open 7:30 p.m., meeting begins 8:00 p.m. - Security Savings and Loan, Menomonee Falls. Amateurs and guests welcome.

**MILWAUKEE RADIO AMATEURS CLUB**  
Fourth Thursday - Wauwatosa Savings and Loan, 7500 W. State St. (November on the third Thursday. No meetings in July, August and December.) Meetings begin at 7:00 pm.

**NORTHERN WISCONSIN RADIO CLUB**  
4th Tuesday - 7:30 p.m., Sept. through April. Peppermill Restaurant, Thunderbird Mall North, Menomonie, WI. Guests welcome.

**NORTHWOODS ARC (RHINELANDER WI)**  
Third Tuesday. Doors open at 7:00 p.m. Meeting at 7:30 p.m. South Park School, Rhineland, WI. Talk-in on 146.93/.34. All interested visitors to the Northwoods are welcomed.

**OZAUKEE RADIO CLUB**  
Second Wednesday - 7:30 p.m. - Saukville Community Center.

**QCWA - WISCONSIN CHAPTER #55**  
Contact Robert Halbman, AJ9P, Treasurer, For

## BADGER STATE SMOKE SIGNALS

### OFFICERS AND STAFF

#### CHAIRMAN

Kenneth A. Ebnetter, K9EN  
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Baraboo, WI 53913

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Baraboo, Wisconsin 53913

### SUBSCRIPTIONS

1 year	(12 issues)	\$8.50
2 years	(24 issues)	\$16.00
3 years	(36 issues)	\$23.00

ADDRESS CHANGES AND CORRECTIONS should be sent to Kenneth A. Ebnetter, address above.

EDITORIAL MATERIAL, PHOTOGRAPHS, FEATURE ARTICLES, AND EXCHANGE PAPERS should be sent to Jim Romelfanger, address above.

DISPLAY ADS or INQUIRIES REGARDING DISPLAY ADS may be directed to Harry Westlund or Kenneth Ebnetter, addresses above.

SUBSCRIPTIONS should be sent, with check or money order (do not send cash), to Jim Decker, address above.

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### EDITORIAL DISCLAIMER

The opinions expressed in editorials, guest editorials, columns, articles, and letters are the opinions of the authors only, and do not, unless otherwise stated, express or imply agreement or endorsement by Badger State Smoke Signals, or by any other organization.

information about meeting dates or joining QCWA Chapter #55. The Wisconsin Chapter holds Spring and Fall dinner meetings.

QCWA - SOUTHEAST WISCONSIN CHAPTER #162  
Meets third Monday monthly, 7:30 p.m., Around the Clock Restaurant, 3012 Rapids Drive, Racine.

RACINE MEGACYCLE CLUB  
Second Monday, 7:30 p.m., Red Cross Bldg., 4521 Taylor Ave., Racine, WI

RIVERLAND AMATEUR RADIO CLUB  
First Tuesday - 7:30 p.m. - Onalaska Community Center, Onalaska WI.

ROCK RIVER RADIO CLUB  
First Tuesday - 7:30 p.m. CST, 8:00 p.m. CDT - Dodge County Sheriff's Dept, 141 N. Main, Juneau WI. ARES net - 146.64 MHz., Monday 7:30 p.m. CST, 8:30 p.m. CDT. 7277 Khz., Saturday 10:30 a.m.

SHEBOYGAN COUNTY AMATEUR RADIO CLUB  
Second Tuesday - 7:00 p.m. - Sheboygan Red Cross/Boy Scout Bldg., 2032 Erie Ave.

SOUTH MILWAUKEE AMATEUR RADIO CLUB  
First Wednesday - Legion Post 434, Shepard Ave., Oak Creek WI. Auctions in March and October.

TAYLOR COUNTY AREA AMATEUR RADIO CLUB (TCAARC)  
MEDFORD  
Usually the 2nd Thursday of the month at 7:00 PM sharp. Usual location: emergency government meeting room; basement of Sheriff's Annex to Taylor County Courthouse, 2nd and Ogden Sts., Medford, WI. Talk-in on 147.75/15 or 145.27(-600) repeaters. Amateurs & guests are welcome. ARS Net, Wednesday nights at 8:30 PM on 147.75/15. For info call Mike, N9GHZ at (715) 223-3996.

TRI-COUNTY AMATEUR RADIO CLUB  
Second Sunday of each month. Meetings are held at 7:00 p.m., at the Trinity Lutheran Church, 314 Barrie, Fort Atkinson, WI.

WASHINGTON COUNTY AMATEUR RADIO CLUB  
Tuesday: ARES/RACES - 7:30 p.m., club meeting - 8:00 p.m., Town of Polk Town Hall, Hwy. 60 and Scenic Dr. Net on 146.13/73 every Monday 7:30 p.m.

WATERTOWN AMATEUR RADIO CLUB  
First Thursday of the month at 7:00 p.m., The Watertown Public Library, 100 S. Water St., Watertown, WI

WAUPACA AMATEUR RADIO CLUB  
First Saturday in March, June, September and December.

WEST ALLIS RADIO AMATEUR CLUB  
Second Tuesday - 8:00 p.m. - St. Francis Savings, 9330 W. Greenfield Ave.

WISCONSIN ASSOCIATION OF REPEATERS  
Meetings are held Quarterly, with time and location to be announced. Repeater licensees, trustees, and sponsors are urged to attend W.A.R. meetings. All interested parties are welcome, as

well.

WISCONSIN VALLEY RADIO ASSOCIATION (WAUSAU)  
First Tuesday - 7:30 p.m. - Location varies; info on 146.04/64, Wausau.

YELLOW THUNDER AMATEUR RADIO CLUB (BARABOO)  
Days rotate: 1990 meeting dates:  
Thu. Mar. 15, room 12; Tue. Apr. 17, room 12;  
Wed. May 16, room 14; Thu. Jun. 14, room 14;  
Fri. Jul. 10, room 14; Wed. Aug. 15, room 14;  
Thu. Sep. 13, room 14; Tue. Oct. 16, room 12;  
Wed. Nov. 14, room 14; Thu. Dec. 13, room 14.  
All meeting at the Baraboo Civic Center, Baraboo, WI. Meetings start 7:30 p.m.

Let Badger State Smoke Signals know your club's meeting dates, and we will let our readers know of your meetings and activities. There may be Amateurs in your area interested in joining your club, or members of other clubs interested in making an interclub visit.

#### THE TEST POINT

The following are known locations where Amateur Radio license examinations are scheduled in the Badger State area. (Underlined are added or changed since last months BSSS.)

March 7, 1990	Milwaukee, WI (MRAC)
<u>March 17, 1990</u>	<u>Milwaukee, WI (BE)</u>
March 31, 1990	Menomonie, WI
April 7, 1990	Madison, WI
April 4, 1990	Milwaukee, WI (MRAC)
April 14, 1990	Eau Claire, WI
<u>April 21, 1990</u>	<u>Milwaukee, WI (BE)</u>
May 2, 1990	Milwaukee, WI (MRAC)
<u>May 5, 1990</u>	<u>Milwaukee, WI (BE)</u>
	(Ozaukee Swapfest)
<u>May 17, 1990</u>	<u>Onalaska, WI</u>
June 6, 1990	Milwaukee, WI (MRAC)
<u>June 17, 1990</u>	<u>Stevens Point, WI</u>
July 13-14, 1990	Eau Claire, WI
September 13, 1990	Eau Claire, WI
<u>September 15, 1990</u>	<u>Milwaukee, WI (BE)</u>
<u>October 20, 1990</u>	<u>Milwaukee, WI (BE)</u>
November 3, 1990	Menomonie, WI
<u>November 17, 1990</u>	<u>Milwaukee, WI (BE)</u>
<u>December 15, 1990</u>	<u>Milwaukee, WI (BE)</u>
Monthly, First Sat.	Racine, WI
	(except January, July & August)
Monthly, Last Sat.	Tomahawk, WI
	(January thru October only)
Monthly, Third Sat.	Loves Park, IL
	Minnesota tests listed at end of column

#### GENERAL RULES FOR MOST EXAMINATIONS:

Be sure to check with sponsors in the event there are changes and/or errors in the dates or information given.

Most examinations require filing an FCC Form 610 and advance registration at least 30 days before the exam date. (Some VECs permit walk-ins. Check with sponsor.)

To register, you must first secure a copy of the current FCC Form 610 and fill it out completely (AND CORRECTLY). Get your form from an FCC Field Office, the ARRL or Badger State

Smoke Signals. Send a 25¢ SASE if you request one from the ARRL or BSSS. In most cases, forms can also be obtained from the sponsoring group.

ARRL/VEC examinations require a check for \$4.95 payable to "ARRL/VEC".

The FCC now requires applicants to show their original Amateur license to the VEC. A copy of your license must be attached to your FCC form 610. You will also be required to have a photo ID, or other acceptable identification.

Technician class licensees must show proof of testing before March 21, 1987, in order to upgrade to General with a code test only.

Additional information is given below.

MILWAUKEE RADIO AMATEURS CLUB - MRAC/VEC  
1990 examination dates: Mar. 7; Apr. 4; May 2; June 5.

Tests are Wednesday evenings at 7:00 p.m. at Wauwatosa East High School, north 74th and Milwaukee Avenue. Enter through the southmost entrance on 74th Street. Go to room 256 on the 2nd floor. Please arrive promptly so testing can be completed before 10:00 p.m. Bring along your original license and three (3) good photocopies, plus two forms of identification, such as a driver's license, etc. A pen and \$4.75 for the exam fee is also required. WALKINS are welcome. To register in advance on a 15 cent U.S. post card, print the grade of license you are applying for, and your name, address, and telephone number. Send the card to MRAC/VEC, c/o Jack Krause, W9JK, 1737 North 116th Street, Wauwatosa, WI 53226, or to Ed Seruga, KE9JJ, 3840 South 43rd Street #21, Milwaukee, WI 53220. Telephones: (414) 774-6999 or (414) 545-6299.

BADGER EXAMINERS (BE) - MILWAUKEE  
Mar. 17, Apr. 21, May 5 (Ozaukee Swapfest), Sep. 15, Oct. 2, Nov. 17, & Dec. 15.

Unless otherwise noted, examinations are administered beginning at 1:00 p.m. to 3:30 p.m. at St. Nicholas Church basement, 5345 N. Green Bay Ave. (2 1/2 blocks south of Silver Spring), Milwaukee. Walkins are welcome. To register in advance, send a post card with your name, test or tests you wish to take, date you wish to take., your call sign, address and telephone number to Badger Examiners, Gary J. Sharbuno, WI9M, 5119 W. Willow Rd., Brown Deer, WI 53223. Telephone (414) 355-0237.

ONALASKA, WI  
May 19, 1990

Onalaska Community Center, 515 Quincy St., Onalaska, WI. Limited walk-ins accepted, but greatly prefer letting us know one month in advance. Contact: Rick Williams, KV9U, 524 Troy St., Onalaska WI 54650. (608) 783-8028

STEVENS POINT, WI (ARRL/VEC)

June 17, 1990 (CWRA swapfest)

University Center, UW-Stevens Point. Morning and afternoon sessions will be offered. Contact: Art Wysocki, N9BCA, 3356 April Lane, Stevens Point, WI. (715) 344-2984

(continued on page 19)

## Wisconsin Nets Association Ltd.

### WISCONSIN NETS

Net	WNA	Freq.	UTC	CST	Manager
BWN	Yes	3984	1200	0600	KC9CJ
BEN	Yes	3985	1800	1200	WA9W
WSBN	Yes	3985	2330	1730	K9UTQ
WNN	Yes	3723	2400	1800	KA9FVX
WSSN	Yes	3645	0030	1830	N9BDL
WIN/E	Yes	3662	0100	1900	WB9ICH
WIN/L	Yes	3662	0400	2200	W9NGP
NWTN	Yes	34/94	0030	1830	NS9Q
6:30 Net	No	01/61	0030	1830	KA9OMC
Gr. Bay	No	72/12	0245	2045	WB9NRK
			Thu.	Wed.	
RACES	No	3993.5	1815	1215	WC9AAG
		USB Tues. and Thurs.			
RACES	No	3993.5	1400	0800	WA9OAY
		LSB Sunday			

## Section Manager's

*notes*



Richard R. Regent, K9GDF  
5003 South 26th Street  
Milwaukee, WI 53221

Congratulations to new Emergency Coordinators: KB9UI, Green Lake County; K9CUI, Waushara County; NKØL, Manitowoc County; and KC9NW, Marathon County.

Ozaukee RC renewed as Special Service Club.

Fox Cities ARC had 33 candidates and 8 examiners at a recent license exam.

Central Wisconsin RA donated 15 copies of "Tune in the World" to school libraries. Check the 621 section of your community library and see if they could use some donated books on ham radio.

Rhineland and Tomahawk, with help of Northwoods ARC and Tomahawk Repeater Association, has had 73 Novice Class graduates in past 2 years.

April 4th at 7 p.m., Wauwatosa East High School exams, contact W9JK or KE9-JJ for more details.

April 7th exams at 8:30 a.m., Four Lakes ARC, Madison, and is one of the few clubs that meets twice a month, the first and third Tuesdays at the American Red Cross.

The Madison Swapfest is April 8th at 8 a.m., sponsored by the Madison Area Repeater Association, held in the Dane County Expo Center Forum Building, details from KB9AQQ.

Exams will be held on April 14th at U.W. Facilities Management Building in Eau Claire.

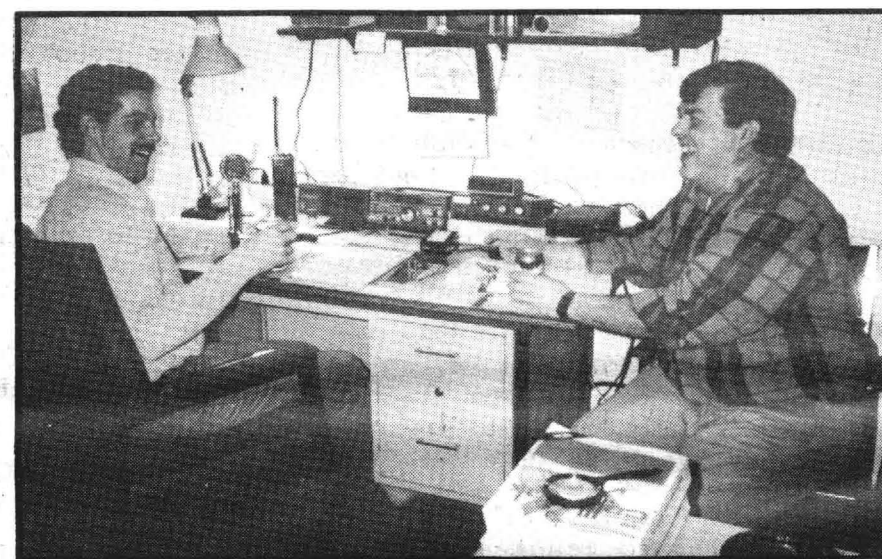
KC9CJ says the Governor's Conference is April 17th at Olympia Village near Oconomowoc; stop in and introduce yourself. We'll be on HF, VHF, and packet radio.

Rock River ARC had two interesting

## FLARC Special Event Station Tallies 750 Contacts

On February 2 and 3, 1990, the Four Lakes Amateur Radio Club of Madison operated Special Event Station W9JZ from Sun Prairie, the Ground Hog Capitol of the World. W9JZ made 750 contacts from Sun Prairie, while happily telling all stations listening that Jimmy the Ground Hog did not see his shadow on Ground Hog Day (Feb. 2); that means, of course, that Spring will be early this year. In the top photo are operators Robert Kitzinger, N9CFL (left), and Peter Quigley, KB9ASQ. In the bottom photo are Mike Sonn, N9IQG (left), and Jake Kitzinger, N9-ITN. Another photo is on page 16 of this issue.

- Photos courtesy FLARC



evening programs on packet radio, one was on basic and the other was about advanced techniques. They also do their best to arrange for rides to their meetings.

Candidates for Instructor of the Year are WB9BBI and KD9AJ.

W9WQ and WB9RQR had CCD antenna article published in "ARRL Antenna Book".

A plaque was presented to K9AA as Old Timer of the Year.

KJ9I has 159 countries worked on 160 meters from his home, using inverted vee 600-foot receiving antenna and reversible beverage antenna.

K9UTQ reports that his son, Scott, is now a new Novice, KB9DVS.

New officers Watertown ARC: Pres. N9HAL; V. Pres WB9MSM; Sec. WA9OAY; and Treas. WA9VYE.

Remember Fred Laun, K3ZO? He was in Thailand operating HSØE recently, making lots of stateside contacts.

Sorry to report Silent Key W9ESJ.

KA9WRL, Scoutmaster in the Grafton area, says he has all 30 Scouts help set up for Field Day, with 5 Scouts interested in operating the radio equipment; they call their group LEFROG, Local Emergency Field Radio Operator Group, but use the call KA9WRL on the air.

## BSSS Club Deal

Badger State Smoke Signals can serve your club as your club's newspaper for as low as \$4.80 per member per year. Your club's minutes and other information and photos which you submit will be published monthly. The 1990 club rates are:

### ALL MEMBERS OF CLUB

Less than 50 members: \$5.40 per year  
50 or more members: \$4.80 per year

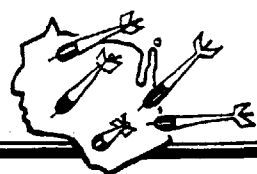
The above plans are billed quarterly, and must include all members to qualify for the above rates. Up to 15 percent additional complimentary mailings can be included at no added cost - useful for political/community leaders and/or prospective members.

### SUBSCRIBING MEMBERS OF CLUB

10 or more subscriptions: \$5.60 per year

For more information, contact Ken Ebner, K9EN, 822 Wauona Tr., Portage WI 53901. Telephone (608) 742-3560.





## HERE and THERE

THE 1991 ARRL NATIONAL CONVENTION AND HAMFEST will be held August 23, 24, and 25, 1991, in Saginaw, Michigan. The five sponsoring clubs and a travel agency have put together a bus travel package which can generate funds for a club's treasury. Here's part of a letter to ARRL Section Managers from Robert Granstra, WB8PLO, Secretary of the convention committee:

"Clubs in your section can come and enjoy the convention, ride as a group, arrive refreshed, stay as a group, and not have to worry about who will do the driving. We are able to provide a bus package that will not only get their group to the convention, but earn their club treasury a rebate for each bus that they are able to fill and send to the convention.... Any club or group can contact us directly and we will provide them with more details...."

Two examples of the rebates are:

From Chicago, the cost is \$42.00 per person, and the rebate to the club would be \$341.00. From Milwaukee, the cost per person is \$40.00, and the rebate to the club would be \$310.00. The rebate is calculated for 48 passengers.

For more information, write 1991 ARRL Convention, P.O. Box 1783, Saginaw, Michigan 48605-1783.

- Thanks Rich Regent, K9GDF

**PACIFIC BELL OFFERS RESIDENTIAL RATES TO AMATEUR REPEATERS IN CALIFORNIA:** Pacific Bell has confirmed that, effective immediately, it is offering residence rates to amateur repeaters with phone patch facilities. Pacific Bell's Customer Services Manager, Jennifer Just, said, "Our decision was based on two factors. One, that ham radio operators are prohibited by law for using the services for business purposes, and.... that Pacific Bell values the emergency backup help amateurs provide and would like to make the service as widely available as possible."

sible."

ARRL staff member John Hennessee, KJ4KB, played an instrumental role in forming Pacific Bell's decision. During the course of several telephone conversations with Ms. Just, John explained the non-business nature of the Amateur Service to her and amateurs' value to the public in times of emergency.

- Excerpted from  
The ARRL Letter, 1/16/90

**MORE GOOD NEWS FOR REPEATERS/REMOTE BASES WITH PHONE PATCH:** Karl Pagel, N6BVU, advises that GTE California, Inc. has agreed to provide telephone service to amateur repeaters with phone patch facilities at residential rates. In a January 9 letter to Karl, Karen Shaw, Vice President of Customer Relations for GTE said that they are making the change in the rate retroactive to October 1, 1989.

The policy will apparently extend to all GTE serviced repeater or remote base owners country-wide. Amateur radio repeater groups who are GTE customers may hear from a GTE customer representative explaining their new monthly service rate. Shortly after that, they will receive a one-time credit on their telephone bill. Any group not receiving the call by January 30 should contact their local business office.

- The ARRL Letter, 01/29/90

**FCC ISSUED CALL SIGN UPDATE:** The following is a list of most recently issued FCC call signs (January 1):

Dist	Group A Extra	Group B Adv	Group C Tec/Gen	Group D Novice
0	WZ0A	KF0HC	N0LJQ	KB0FPA
1	WB1D	KC1SI	N1HGA	KA1UVU
2	WV2E	KE2RB	N2KER	KB2IZT
3	NX3T	KD3QK	N3HSS	KA3VOL
4	AB4SL	KN4CV	N4XSR	KC4NUW
5	AA5PS	KI5BH	N5PUL	KB5LIR
6	AA6SY	KK6EH	N6XLC	KC6HTK
7	AA7CY	KF7ZB	N7OAY	KB7JGU
8	WY8G	KF8DH	N8LXQ	KB8IRE
9	WN9I	KE9TZ	N9JEN	KB9DUJ
GU	KH2M	AH2CF	KH2EH	WH2AMK
HI	**	AH6KD	NH6VQ	WH6CGH
AK	**	AL7LS	NL7TD	WL7BWC
USVI	NP2F	KP2BS	NP2DO	WP2AGZ

PR \*\* KP4QK WP4XG WP4IQZ

\*\* indicates that all 2 x 1 call signs have been assigned in those areas.

- The ARRL Letter, 01/29/90

**PARTICIPATING CLUBS:** Please make every effort to have your club's material (minutes, etc.) in the mail to K9ZZ no later than five days after your club's meeting! We cannot make space allotments for other material until we have your club's information here and typed up. Please help us to serve you on a timely basis. Your cooperation is very important, and will be appreciated!

- Editor

**THE WISCONSIN QSO PARTY** is indeed on a Saturday this year. Usually held on a Sunday, an error resulted in a Saturday event instead. The error was discovered after the information had been sent to the Amateur Radio press, and it was too late to change the date. Please see the QSO Party Reminder on page 7 of this issue of Badger State Smoke Signals.

- West Allis Radio Amateur  
Radio Club Hamtrix

**ANOTHER OSCAR LAUNCHED!** The Japan Amateur Radio League and NASDA have successfully launched the second Japanese-built Amateur Radio satellite: JAS-1B - Fuji/OSCAR 20. The launch took place on February 7 from the Tanegashima Space Center, with the satellite carried into orbit atop an H-1 booster. The satellite transmits a CW beacon on 435.795 MHz, as well as having a transponder output from 435.8 to 435.9 MHz, with parameters and a mission profile very similar to JAS-1 - Fuji/OSCAR 12.

- N2GJ in Westlink Report, 02/16/90

**REMEMBER,** Badger State Smoke Signals can use good, sharp photos of radio amateurs.. at their stations, erecting antennas, helping with parades or walkathons, at club meetings.. anything that hams do. And, remember too, that we would be very happy to have your subscription, if you are not already a subscriber. Use the form below!

- Editor



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## Ham Music is Loud and Clear

By Richard R. Regent, K9GDF  
5003 South 26th Street, Milwaukee, WI 53221

Some Wisconsin hams enjoy using both radio waves and sound waves. At one time they are on-the-air communicators crouched in front of their radios talking to people across the country; later they transform into musical artists playing musical instruments or singing in front of an audience.

Take Les, W9YCV, of Greenfield, for example. He's been singing his heart out in church choirs for 38 years. First, at Baltimore, Maryland for seven years, then Eau Claire, Wisconsin, three years, and since October, 1962, when he moved to his present QTH, Les has been singing in the choir at the Holy Trinity Church. Although Les never sings solo, he was in an all-male church quartet. Besides the Sunday singing, Les occasionally leaves traffic nets for an early evening choir practice.

Barb, N9DIJ, of Milwaukee, sings and plays the organ and piano, and is learning to play the guitar. Barb began her musical assistance at her church 21 years ago, by playing piano at Sunday School. She has combined musical talents by performing at Adoration Evangelical Lutheran Church as their organist, pianist, and choir director. Barb picks songs for the church services, and teaches new songs to the 18-member choir on rehearsal nights. Sometimes she recommends wedding music, practices with bridal parties, and then plays for weddings.

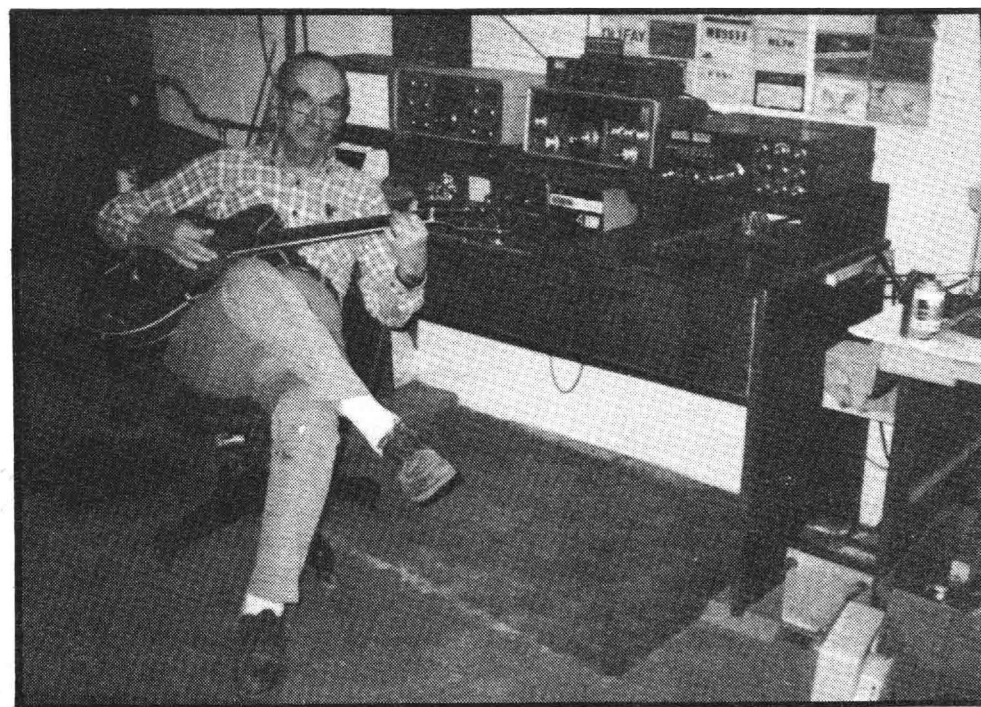
Rich, K9GDF, of Milwaukee, has intermittently played the clarinet for 32 years, most recently at church services or for Christmas caroling at homes of the older folks who are unable to get to the church to hear the music. He's planning on doing something new this year, Easter Caroling for the shut-ins, with the choir, and accompanied by clarinet playing. Rich quips, "There are only two instruments that are worse than a clarinet - two clarinets." Rich sang bass in a quartet recently; the pastor and two women sang other parts to a song for about 235 parishoners. Leon, K9GCF (unrelated to K9GDF), of Franklin, was in the congregation during a 9:00 a.m. service, when Barb and Rich played, and the choir sang. After the service, Leon surprised Barb and Rich with some nice compliments.

Warren, K9IZV, of Milwaukee, plays piano at Sunday School for the Christian Science Church in Whitefish Bay. He also provides piano music four or five times a year for a service his church holds at the House of Correction.

Bob, N9IAI, of Waupaca, once played coronet. Bob says his memory of the fingering and notes needs an overhaul more than his coronet. So, for the past five years, Bob has been singing bass in the church choir each week, although he says he doesn't read music very well, and needs lots of repetition to learn new songs. "Just love to sing them songs to the Lord," says N9IAI.

Some musicians get paid for their skills. Clyde, W9JS, of Oregon, Wisconsin, makes and sells expensive banjos, sings, and performs. Greg, WD9DHI, delights customers when he uses his keyboard skills to test organs after he fixes them. Curt, N9CP, of Madison, says his wife plays violin with the symphony, and that she sometimes gives lessons. Norm, KB9QL, of Oak Creek, used to teach guitar. And of course we all remember the happy music of the late Clyde, W9HSY, who was a musical entertainer, performer, and singer at many club gatherings.

Dave, WB9GZP, of Milwaukee, has a Bachelor of Arts degree in Music from the University of Wisconsin - Oshkosh, and continues to enjoy studying music. Dave plays percussion instruments like drums, xylophone, vibrophone, marimba, and tympani in an 18-piece big band called "In the Mood". The band played this New Year's Eve at the swanky Milwaukee Hyatt, also this past summer at exciting Summerfest, and at other times for many weddings. In the early years of his musical development, Dave worked with several well-known musicians, recorded albums, and was on a two-year tour with the Air Force NORAD Band in the United States, Canada, and Mexico. Dave is also a sales rep at Technipower.



Among the many talents of Bob King, KA9GNY, above, is playing guitar; his preference is playing rhythm guitar with a combo. He is an early Chet Atkins fan (Chet Atkins is also a Radio Amateur), and has been known to take part in jam sessions. Bob is also a wood carver, and has helped to restore several circus wagons at the Circus World Museum in Baraboo. He is a retired railroad telegrapher, and is an active member of the Morse Telegraph Club.

Dave, KJ9I, has been distracted from playing his saxophone  
(Continued on page 7)

**JANUARY 4, 1983**

\*\*\*\*\*

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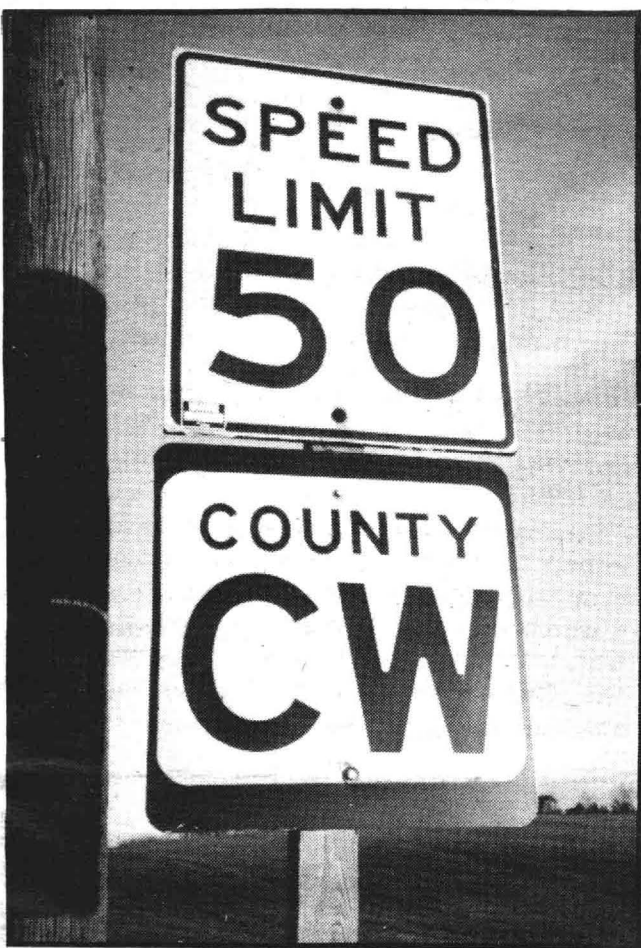
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## John's Junk Box

By John W. Frank, WB9TQG  
P. O. Box 5113  
Madison, WI 53705



John Frank, WB9TQG, is taking a month off from his Junk Box and Repeater Profiles duties; he will be back next month. He sent along this picture to remind us to keep our code speed under 50 words a minute. John would like to hear from our readers - please send your comments and/or suggestions to him at his address above. Thanks!

## FCC Comments on Amateur Feedback to McNamara Letter

On October 11, 1989, Federal Communications Commission Special Services Division Chief Robert H. McNamara wrote to a number of amateurs, seeking comments and information on phone patches, information bulletins, and over-the-air telegraphy practice. The letter requested information and insight that could bring a resolution to "the unfortunate continuing over-the-air dispute that takes place on the 20 meter band.... which is jeopardizing international good will...." The letter asked a number of questions on these topics. The American Radio Relay League's response was submitted on November 15, 1989, by ARRL Counsel Chris Imlay, N3AKD. (See *Badger State Smoke Signals*, January 1990, page 14).

In a letter dated December 21, 1989, McNamara stated that 45 replies were received in response to his letter, and that although the responses "contained somewhat conflicting information and views, they were helpful in understanding the issues so that a course of action could be selected." McNamara stated that it appeared that the intensity of the debate has subsided, and that most of those participating in it have recommitted themselves to the basic principles of the amateur service by attempting to resolve such "disputes" off the air.

He stated that the "disputes" are centered in three main areas: phone patch communications on the HF bands, information bulletins, and telegraphy practice transmissions. McNamara stated that the replies "...confirm that misuse of an important amateur service frequency band was having a major negative impact upon the service. They clearly show that the amateur service was not fully cooperating in selecting transmitting channels and in making the most effective use of the amateur service frequencies as required by Section 97.101(b)."

McNamara stated there were two general views for a solution in the responses. One, that the amateur community should be allowed to solve the "problem" internally. The second, that the Commission should mount a massive enforcement effort. McNamara said the second approach was not possible due to enforcement priorities and budget constraints; if direct Commission intervention proved to be necessary, it would be in the form of additional restrictions that may affect all amateur operators. Mr. McNamara said, "In view of the above, we will afford the amateur community the self-regulation opportunity suggested." He went on to suggest that interested individuals and organizations participate voluntarily in developing a plan for amateur self-regulation.

Mr. McNamara closed by observing that the FCC wants "to enable amateur operators in the United States to create and pioneer communications systems, limited only by their personal interests, imagination and technical skills. We believe that it would be tragic if the degree of regulation of the service had to be increased because the amateur service community could not effectively resolve its internal disagreements. Additional regulation for the sole purpose of maintaining order among the licensees will surely detract from the amateur service fully meeting its objectives."

In reporting to the ARRL Directors, Executive Vice President David Sumner, K1ZZ, observed that Mr. McNamara's conclusions do not address the specific suggestions for Commission action offered by the League in its November 15 response, and that the course of action Mr. McNamara is recommending is very similar to an effort to bring opposing factions together that was undertaken, in good faith but without success, in Orlando last March.

- The ARRL Letter, 01/16/90

## QSO Party Reminder

The 1990 Wisconsin QSO Party, sponsored by the West Allis Radio Amateur Club, will be held from 1800Z March 10 until 0100Z March 11 (12 noon until 7 p.m. CST March 10). Full rules and a summary sheet were published in the February, 1990 issue of *Badger State Smoke Signals*. If you need more summary sheets, write West Allis Radio Amateur Radio Club, P.O. Box 1072, Milwaukee, WI 53201; the summary sheet which was published in BSSS may also be used. The Wisconsin QSO Party is open to all amateurs, anywhere, and is known as one of the best events of its kind in the country. Your participation is encouraged!

## Ham Music

(Continued from page 6)

while he is completing his MBA degree. He played a few years in the Oconomowoc High School band, and especially recalls marching at halftime at a televised Green Bay Packer game. Dave now works at the telephone company.

Paul, KA9OBP, of Portage, plays his trombone in a jazz group, and at his high school.

Drummer Bob Probst, W9RUB, trumpeter Vern Carlson, WB9PTJ, and keyboard artist John Wolozyn, W9ORS (Old Rip Snorter), provided live musical entertainment for the Madison Area Repeater Association at their Christmas Party. John, W9ORS, of McFarland, although blind, is a real good piano player, and is also the or-

ganist at the Elks Lodge. In his spare time, he tunes pianos.

There are many amateur radio operators in Wisconsin who love to play music and sing songs. There are listeners who love to hear their music. Keep your ears open, and remember: music soothes the savage ham.

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## New Era in Amateur Satellite Communication Begins

# Flawless Launch Yields Six OSCARs

On Sunday, January 21, at 0135 UTC, the "brilliant plume" coming from the first stage of an Ariane V-35 rocket marked the beginning of a picture-perfect launch of the next generation of OSCAR (Orbiting Satellite Carrying Amateur Radio) satellites. At that time, Uosats D and E and the four Microsats (Pacsat, Webersat, LUsat, and DOVE) began their journey into space from Kourou, French Guiana. An attempt to launch 24 hours earlier had to be "scrubbed" due to thunderstorms near the launch site.

The AMSAT (Radio Amateur Satellite Corporation) Launch Information Network Service (ALINS) covered the launch, and the events surrounding it. ALINS was heard around the world with rebroadcasts by W1AW, WA3NAN, W5RRR, and a host of other HF and VHF stations on virtually all amateur bands.

The rocket reached orbit velocity of 7 kilometers/second just before 16 minutes into the flight, as it passed east of Bermuda. At 20 minutes, 4 seconds, Uosats D and E were deployed, becoming OSCAR 14 and 15. One minute later, the four Microsats were successfully deployed, becoming OSCAR 16 - 19 respectively.

Ariane Launch Control and AMSAT staff applauded as the amateur satellites were deployed in this "very historic moment" for AMSAT and Amateur Radio.

In a letter to AMSAT President Doug Loughmiller, KO5I, American Radio Relay League Executive Vice President Dave Sumner, K1ZZ, congratulated AMSAT for the successful orbiting of the four Microsats. "What the AMSAT team has done," Dave said, "reflects credit on the entire Amateur Radio community. The timing couldn't be better as we begin preparation for the World Administrative Radio Conference to be held in 1992.

"AMSAT can justifiably take pride in providing the Amateur Radio community with a new communications capability. The American Radio Relay League shares in your pride and is pleased to have had the opportunity of contributing to the project."

In confident anticipation of a successful launch, the ARRL Board of Directors, on January 20, passed the following resolution:

"The ARRL Board of Directors, on behalf of the officers and members, proclaim for all to note that:

"Whereas the amateur satellite program represents a major source of technological advancement within the Amateur Radio Community and

"Whereas the amateur satellite program has a long history of providing useful communications resources to Radio Amateurs worldwide and

"Whereas the amateur satellite program is a major element of the public service, education, and scientific research being conducted via Amateur Radio today and

"Whereas the amateur satellite program represents the resourceful, creative, innovative, and volunteer spirit of Radio Amateurs everywhere and

"Whereas 1990 will see the launch of eight new OSCAR satellites including six on a single launch vehicle with the Microsat/Uosat launch and

"Whereas 1990 will see the construction of an additional OSCAR satellite by AMSAT Italy and AMSAT North America begin and

"Whereas 1990 will mark the beginning of the Phase III-D construction activity by a broad base of international amateur participants

"Therefore be it resolved, that in recognition of the contribution of the amateur satellite program to the Amateur Radio Service and of the significant events which are to occur during the course of the year 1990 within this discipline of amateur radio, we hereby declare:

"1990 the Year of the Amateur Satellite Program."

- The ARRL Letter, 01/29/90

## Microsat/UoSat Receive Antennas

Drawing on previous studies of ground antennas for low earth orbit satellites and operating experience, Dick Jansson, WD4-FAB, has designed and theoretically analyzed performance of an antenna which is thought to be optimum for microsat work. Essentially, the antenna is a fixed, dual band J-pole with two feed lines.

Details of the antenna design and analysis will be published in the February 1990 issue of the AMSAT-NA Journal. Users of AO-13 class satellite stations using the gain antennas to track microsats will experience, in some cases, up to 50 dB of excess link margin. The nature of the PSK transmission mode from the pacsats is such that excessive signal can actually make acquisition and demodulation more difficult. In any case, there is plenty of signal available to cover losses incurred from the use of fixed antennas and polarization mismatches.

Microsat users, particularly those intending to set up automatic mail forwarding or data capture installations are encouraged to use fixed antennas so as to

## Microsat and UoSat Frequencies

The following are the Microsat and UoSat listening frequencies and modes, listed in order of deployment. Information is presented in this order: Spacecraft, OSCAR number, Frequency (MHz), and Mode:

\* UoSat D, UO-14, 435.070, 9600 bps AFSK AX.25

\* UoSat E, UO-15, 435.120, 9600 bps AFSK AX.25

\* PACSAT, PO-16, 437.025, 1200 bps PSK AX.25

\* DOVE, DO-17, 145.825, 1200 bps AFSK AX.25 (FM)

\* WEBERSAT, WO-18, 437.075, 1200 bps PSK AX.25

reduce automatic system maintenance and wear to a minimum. Automated ground stations requiring significant maintenance are likely not to be able to support much long term use. For fixed antennas, Jansson recommends a vertical arrangement, such as the dual J-pole design, over turnstile-reflectors, and other traditional horizontal or circular designs.

Simple, low gain vertical antenna radi-

\* LUSAT, LO-19, 437.150, 1200 bps PSK AX.25

\* LUSAT/CW, LUSAT, 437.125, 12 WPM CW telemetry

Packet transmission from DOVE may be monitored with an unmodified TNC-2 or clone, using an FM receiver. The other microsats (PACSAT, WEBERSAT, and LUSAT) require an SSB receiver and TNC with a 1200 bps PSK demodulator (FO-12 or compatible). The 9600 bps modulation scheme used by the UoSats is compatible with the K9NG and other similar 9600 baud modems commonly used in terrestrial packet applications.

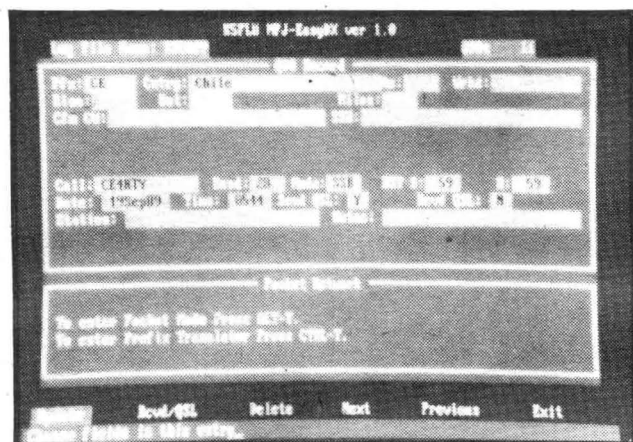
- The ARRL Letter, 01/16/90

ation patterns closely match that required by low orbit satellites at various slant ranges and corresponding elevation angles. This is particularly true near the horizon, where the most gain is needed, and the satellites spend most of their visible time. The drawback is linear polarization, but Microsat downlinks are circularly polarized so that the polarization mismatch is typi-

(Please turn to page 9)



## New Products



### MFJ-1281 Easy-DX™ Log/Terminal Program/PacketCluster™ Interface

MFJ Enterprises, Inc. announces the release of new IBM™ compatible software that helps you get your DXCC award. The software is priced at only \$39.95.

One reviewer of the beta version of MFJ-1281 Easy-DX™ called it "the single indispensable program for any DXer with a computer." (Peter Smith, N4ZR, *Digital Digest*, July/August 1989, p. 12).

Why? Because the new MFJ-1281 Easy-DX program is a unique tool that instantly organizes all your DXCC activity, plus you get a packet terminal program and a PacketCluster ("Pavillion Software) interface so you'll get the very latest DX information.

You can enter any call, and it tells you at a glance whether you need that country on the band, the mode, or both. It also tells you if you've worked the station before. Plus, it gives you a list of contacts with the country, including bands, modes, and QSLs received - so you can get the station to QSY to the band you need him on.

When you enter a call or prefix, it tells you the country, azimuth to the (or a) major city, and the sunrise/sunset times at that QTH.

You can import contest logs from the popular CT logging program so that you can easily bring your contest QSOs into your DXCC log. It even keeps up with your QSL activity.

Packet radio users get a built-in terminal program. MFJ Easy-DX will monitor the PacketCluster DX spotting network, and send "DX" in Morse Code if a country you need on the band, mode, or both is reported on the network. You don't even need to be at your computer - so long as you're within earshot of the speaker.

You get two packet screens. One is a receive only screen that can be displayed along with Easy-DX, so you can monitor any packet channel while you log your SSB and CW contacts into MFJ Easy-DX. The other screen is a send and receive packet terminal program that is built into MFJ Easy-DX.

MFJ Easy-DX also prints QSL labels, keeps up with your outstanding QSLs, prints you a summary of DXCC activity by

band and mode, prints out daily log sheets, lets you update your log as QSLs are received, and more.

DXCC is within your grasp. Let MFJ's incredible new MFJ Easy-DX help. MFJ-1281 comes on two 5-1/4" floppy disks. It requires a 100% IBM compatible computer with at least 512K of RAM. A hard disk is strongly recommended.

Get new MFJ Easy-DX today. You'll be glad you did.

For more information, contact any MFJ dealer, or MFJ Enterprises, Inc., P.O. Box 494, Mississippi State, MS 39762, or call (601) 323-5869; Telex: 53-4590 MFJSTKV; FAX: (601) 3-4590 MFJSTKV; toll-free at (800) 647-1800.

- MFJ Enterprises news release

## OSCAR

(Continued from page 8)

cally only 3 dB.

Turnstile-reflector antenna response drops off near the horizon where it is most needed, and has peaks at higher elevations where low orbit satellites spend relatively little time.

For further details and dual J-pole construction information, look for WD4-FAB's article in the February issue of the *AMSAT-NA Journal*. If you already have a simple vertical (quarter wave ground plane or vertical dipole) in place, it should be adequate.

- The ARRL Letter, 01/16/90

## ROCKFORD HAMFEST - '90

AMATEUR RADIO AND COMPUTER FAIR  
SATURDAY, MARCH 31, 1990

8:00 A.M. - 3:00 P.M.

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- Indoor flea market - Outdoor tailgating
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- Amateur Radio Exams

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- At the door \$4.00

### Outdoor Tailgate Space:

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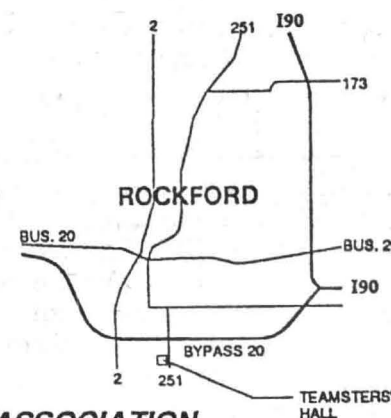
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Rick McGlynn, N9DAZ, General Chairman, at (815) 623-6064  
Joe Roling, N9HEZ, Co-Chairman, at (815) 399-6995
- Booth and/or table information:  
Al Gaines, KA9VSZ, Registration Chairman, at (815) 962-3910
- Advance ticket information:  
Brian Martens, KA9PMM, Ticket Chairman, at (815) 962-0992

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## **New Products**

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**Dual Band Watch:** Capable of receiving both main and sub band audio simultaneously. Multiple scanning systems also function concurrently on the main and sub bands.

**Reach Beyond the Stars:** Reach beyond the stars with the new IC-970. Communications via satellite has never been so easy. This amazing transceiver automatically tracks uplink and downlink frequencies when the tuning control is rotated. Ten memory channels specially designed for quick satellite communications emphasize ICOM's total commitment to your future communication needs.

**Progressive Quality Throughout:** ICOM's extra large multi-function display is easy to read, providing complete main and sub band information. 99 memory channels per band store operating frequencies, modes, and repeater information.

ICOM's exclusive DDS system accelerates the PLL circuit's lockup times, and provides improved carrier-to-noise ratios. A built-in pager and code squelch function, plus direct keyboard entry and ICOM's CI-V system are just a few additional IC-970 features that will propel you into the 21st century. You'll see why the IC-970 is the transceiver of a new generation!

The IC-970 will be available in April, 1990.

- ICOM news release

### **ICOM IC-R1 TINY WIDEBAND RECEIVER**

The smallest wideband, handheld receiver available today, the ICOM IC-R1 continuously covers 100 KHz - 1300 MHz, with AM, FM, and Wide-FM modes. Measuring just 1.9" W x 4.0" H x 1.4" D, this tiny receiver can go anywhere with you. The size is unbelievable!

**Built-in NiCd batteries:** Like the famous "S" series handhelds, the IC-R1 has built-in NiCd batteries and optional battery packs.

**Multi-Function Scanning:** The IC-R1 incorporates a variety of scan functions to meet all your needs. They include: programmed scan, memory scan, selected mode memory scan, and auto memory write scan.

**Keyboard and Tuning:** This compact, easy to operate receiver features both direct keyboard entry and rotary tuning control.

**100 Memory Channels:** The tiny IC-R1 has 100 memory channels that store frequency, mode, and skip functions. You can even mask memories!

**Built-in Clock:** More advanced functions of the IC-R1 include a 24-hour clock and automatic timer. Your receiver can turn itself on or off, super convenient for scheduled listening!

The world's smallest full-featured receiver, the IC-R1 is also equipped with a power saver function, adjustable LCD contrast, a signal indicator, an external DC power jack with battery charge capability, plus a large variety of other options from the "S" series handhelds. The new IC-R1 will be available in March, 1990.

- ICOM news release

### **ICOM IC-R100 ADVANCED WIDEBAND COMMUNICATIONS RECEIVER**

ICOM, the champion in receiver technology, introduces the new IC-R100 wideband communications receiver. The IC-R100 provides tremendous listening versatility in a variety of locations. The receiver's coverage includes air band, marine band, and emergency service frequencies, as well as amateur bands. The compact IC-R100 is designed for flexible installation at home or in your car. Go the distance with ICOM's new IC-R100 wideband communications receiver!

**Super Wideband Receive Capability:** The IC-R100 continuously covers a wide frequency range within 100 KHz - 1856 MHz, in AM, FM, and wide FM modes at home, or in your vehicle.

**Easy to Operate Keyboard and Tuning Control:** The IC-R100 has complete programming versatility. You can use either the keyboard or tuning control to access frequencies and memory channels.

**121 Memory Channels:** A total of 121 memory channels is available on the IC-R100. 100 memory channels store operating frequencies, modes, RF attenuator, and preamplifier settings. Twenty scan edge memory channels are used for specifying 10 pairs of frequency ranges required for program scan. Plus, the receiver has one independent memory channel used for priority scan.

**Built-in 24 Hour Clock:** The IC-R100 includes a 24 hour clock, and a variety of timer functions. Even if the receiver's external power supply is disconnected, the clock continues to run because of the built-in lithium battery. The different tim-

er functions are convenient for scheduled programs. The receiver can just turn it self on and off.

The versatile IC-R100 also includes three separate antenna connectors, a built-in preamplifier and attenuator, plus a complete variety of scan functions.

The new IC-R100 will be available in March, 1990.

- ICOM news release

### **ICOM IC-R72 HF COMMUNICATIONS RECEIVER**

ICOM's expertise in designing and producing advanced communications receivers continues to grow with the IC-R72. The worldwide acclaim given to the IC-R71A sets precedence for the IC-R72.

**Compact:** Measuring only 9.5"W x 3.7"H x 9.0"D, the IC-R72 is compact and loaded with the most asked-for features.

**All Mode:** The IC-R72 continuously covers 100 KHz - 30 MHz in SSB, AM, and CW modes, with high sensitivity. FM mode receiving is also available by adding an optional UI-8 FM Receiver Unit.

**100 dB Dynamic Range:** The IC-R72 boasts 100 dB dynamic range of superior receiver circuits. Receive a desired station's signal clearly, even through strong signals from nearby broadcasting stations.

**DDS System:** The PLL circuits in the IC-R72 are equipped with ICOM's advanced DDS system for very fast lockup times. It's the same system that has made the state-of-the-art IC-781 and IC-R9000 so popular with serious operators everywhere.

**101 Memory Channels:** The IC-R72 is equipped with 99 convenient memory channels, plus 2 independent scan edge memory channels. Operating frequency and mode can be stored into any memory channel.

Other convenient features of the IC-R72 include the built-in RF attenuator and preamplifier, a noise blanker, ICOM's CI-V system, built-in clock with timer function, plus multiple scan functions.

The new IC-R72 will be available in March, 1990.

- ICOM news release

### **ICOM TOLL-FREE LITERATURE REQUEST HOT LINE**

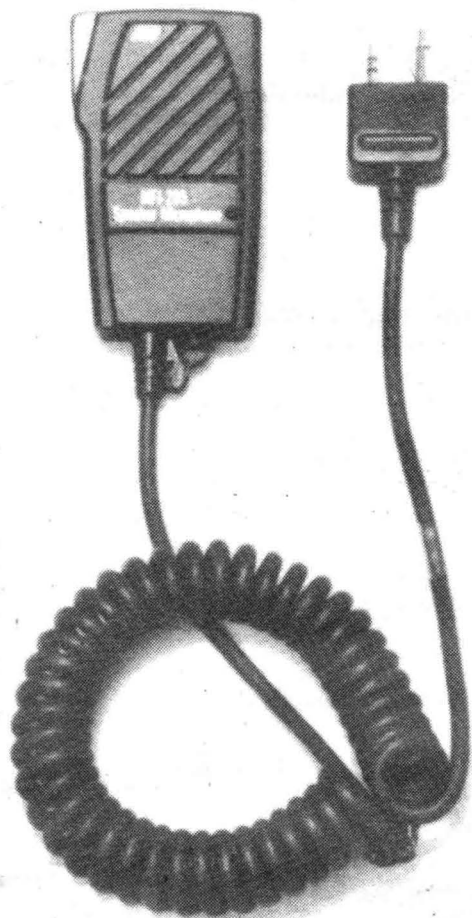
ICOM has installed a toll-free literature request hot line for our retail customers. ICOM takes pride in providing the best customer service in the industry, and now we are expanding our services. Retail customers can request any ICOM literature by calling (800) 999-9877. When calling, they will receive a recording, asking them to clearly state their specific literature request and complete address. It's that simple! The next day, their ICOM literature will be in the mail.

Thank you for supporting ICOM!

- ICOM news release



## New Products



### MFJ MINIATURE SPEAKER/MIKES

MFJ Enterprises, Inc. announces the release of several new miniature speaker/-microphones. They fit most handheld radios, are available with regular or "L" connectors, and measure just 2" x 1-1/4" x 1/4".

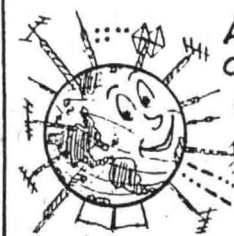
In this tiny package, you get a first-rate electret mike element and wide range speaker, for superb audio on both transmit and receive.

These feature-packed speaker/mikes also give you an earphone jack for private listening, push to talk button, swiveling lapel/pocket clip, and a lightweight retractable cord.

MFJ-285 and MFJ-285L (with "L" connector) fit Icom, Yaesu, and Satec HTs; MFJ-287 and MFJ-287L fit Kenwood. All four models come with MFJ's one year guarantee.

For more information, contact any MFJ dealer, or MFJ Enterprises, Inc., P.O. Box 494, Mississippi State, MS 39762, or call (601) 323-5869, Telex: 53 4590 MFJSTKV, FAX: (601) 323-6551, or order toll free at (800) 647-1800. - MFJ news release

Cheer'o



AMATEUR RADIO IS A MEANS  
OF FRIENDLY WORLD-WIDE  
COMMUNICATION--  
--INTERNATIONAL  
MORSE CODE IS ITS  
COMMON LANGUAGE!

BADGER STATE SMOKE SIGNALS

W90DV

18th  
Annual

# MADISON SWAPFEST & COMPUTER FAIR

Madison, Wis.

Sponsored by Madison Area Repeater Association - WB9AER - Madison, Wis.

DANE COUNTY EXPO CENTER FORUM BLDG.

TALK - IN ON 147.75 - 147.15 REPEATER

**Doors Open at 8 A.M. - Sun., April 8, 1990**

BOOTH EXHIBITORS & FLEA MARKET SELLERS WITH 6 OR MORE TABLES AT 2 A.M.

ALL OTHER SELLERS ADMITTED AT 7 A.M.

**ELECTRONIC EQUIPMENT AND COMPONENTS**  
FOR HAMS, COMPUTER HOBBYISTS AND EXPERIMENTERS  
**COMMERCIAL DEALERS INCLUDING COLORADO COMM. CENTER**  
FOR BOTH NEW AND USED EQUIPMENT

DELICIOUS SANDWICHES - DONUTS - ROLLS - COFFEE - POP - MILK

ADMISSION PER PERSON - \$3.00 ADVANCE - \$4.00 DOOR (Children 12 & Under Free)

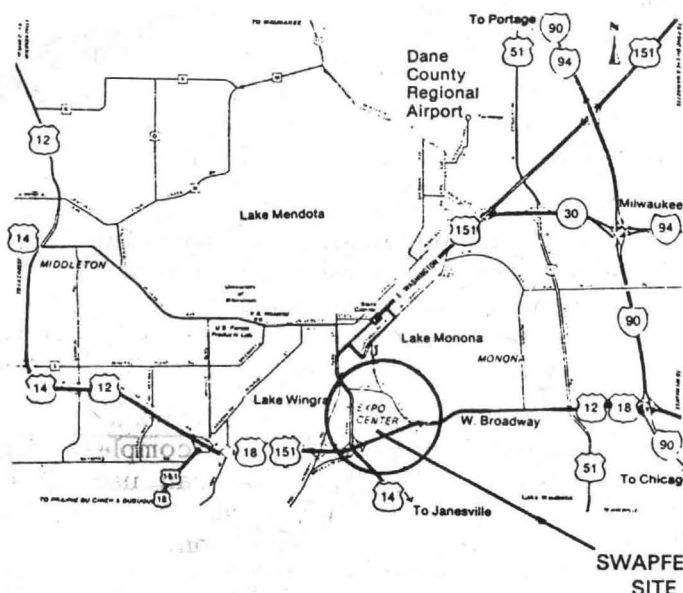
TABLES - \$9.00 ADVANCE - Reserve Early - Sell Out Every Year.

TABLE RESERVATIONS DO NOT INCLUDE ADMISSION PRICE - YOU MUST BUY SEPARATE ADMISSION TICKET

**WE URGE YOU TO CARPOOL AS THE COUNTY CHARGES A PARKING FEE!!!**

For Information on Exhibitor Booths, Contact MARA, Box 8890, Madison, WI 53708-8890

Or Call (608) 249-7579 Answer Machine



## MADISON SWAPFEST LOCATION MAP

NEXT DOOR TO DANE COUNTY COLISEUM - Approx. 4 miles west of Hwy. 12/18 and I-90 Interchange. Watch for John Nolan Drive Exit. Just follow "Coliseum" signs to Dane Co. Expo Center, located 1/2 mile north of Hwy. 12/18 Beltline, on John Nolan Drive, on Madison's south side. Talkin will be on MARA 147.75 - 147.15 repeater.

## ADVANCE RESERVATION COUPON

NAME \_\_\_\_\_ CALL \_\_\_\_\_

ADDRESS \_\_\_\_\_ CITY \_\_\_\_\_ STATE \_\_\_\_\_ ZIP \_\_\_\_\_

PLEASE SEND \_\_\_\_\_ TICKETS AT \$3.00 Per Person

PLEASE RESERVE \_\_\_\_\_ TABLES AT \$9.00 Each - Table Fee Does Not Include Admission Fee.

TOTAL AMOUNT ENCLOSED \$ \_\_\_\_\_

If there are no more tables available do you still wish to purchase tickets? YES( ) NO( )

A.C. Outlets available to Booth Exhibitors ONLY.

Please Send S.A.S.E. Make Checks Payable to MARA - Mail to MARA, Box 8890, Madison, WI 53708-8890.

Tickets and Table Reservations Confirmed by Return Mail.

RESERVATIONS NOT ACCEPTED AFTER MARCH 31, 1990.



## Green Bay Club Celebrates 50 Years with ARRL



The Green Bay Mike and Key Club received its 50 Year Certificate of Affiliation with the American Radio Relay League at the club's December meeting. Shown from left are: Club Secretary Gregg Seidl, KA9LOE; Treasurer Pat Bryhan, KA9VRK; Founding Member Jerry Van, W9VOW; ARRL Wisconsin Section Traffic Manager Dick Hugi, KC9CJ; President Robert Heiser, WA9SWX; and Vice-President Scott Cole, KB9AMM.

The American Radio Relay League presented a certificate to the Green Bay Mike and Key Club, honoring the club's 50 years of affiliation with the ARRL. The certificate was presented at the club's December, 1989 meeting.

The club affiliated with the League on October 21, 1939, with about 15 members. Today, the club has grown to more than 110 members. Four of those members are founding members from 1939, and they are still active in the club.

The club holds the ARRL Charter number 1922.

Meetings are held every second Tuesday of the month at the Red Cross Center in Green Bay. The club maintains three repeaters, and has HF and 2-meter equipment at their club station at the Red Cross for emergency com-

munications. The club has three generators, and has antennas for both portable and fixed operation.

The club is active in public service communications, and has assisted with the March of Dimes Walkathon, the Jaycees River Fest, bike-a-thons, and the YMCA Triathlon. Members work severe weather nets with the National Weather Service office in Green Bay, and they assist the Red Cross Disaster Service and Brown County Emergency Government. They also are active in the Amateur Radio Emergency Service (ARES) and the Radio Amateur Civil Emergency Service (RACES). The club sponsors a Novice class every year.

The club is currently putting together a club library, is working on a hamfest for this fall, and they are updating their main repeater.

## Attention Hamfest Sponsors

Badger State Smoke Signals offers special, reduced non-commercial advertising rates to clubs and groups sponsoring hamfests and swapfests.

For just \$25.00 for a one-time insertion, we will reproduce your flyer as a display ad. We'll run it twice for \$45.00. We reduce your flyer slightly, to two-column width, and border it. Additional insertions (three or more) are \$20.00 each. We request that flyers submitted for publication be printed on white stock, if at all possible; certain colored stock is extremely dif-

ficult to copy from.

Another plan we offer is a business card on our back page, for just \$48.00 per year. This plan keeps your event's date publicized all year long; you also receive one insertion of a display ad at no additional charge!

We ask that you send payment with your ad; that saves us billing costs.

More information is available from Ken Ebner, K9EN, 822 Wauona Trail, Portage, WI 53901, telephone (608) 742-3560.

## Scholarships Available

The Foundation for Amateur Radio, Inc., a non-profit organization with headquarters in Washington, D.C., plans to award thirty-three (33) scholarships for the academic year 1990-1991 to assist licensed Radio Amateurs. The Foundation, composed of fifty local area Amateur Radio clubs, fully funds five of these scholarships with the income from grants and its annual Hamfest.

It administers, without cost to the donors:

7 scholarships for the Quarter Century Wireless Association;

3 each for the Baltimore (MD) Amateur Radio Club, the Radio Club of America, and the West Allis (WI) Radio Amateurs Club (see below);

and 2 each for the Dade (FL) Radio Club, the Amateur Radio News Service, and the 10-10 International Net.

It also administers 1 scholarship each for the Richard G. Chichester Memorial, the Young Ladies' Radio League, the Columbia (MD) Amateur Radio Association, the Frederick (MD) Amateur Radio Club, the Vienna (VA) Wireless Society, the Goddard Amateur Radio Club, and the Kevin B. Perdue Memorial.

Licensed Radio Amateurs may compete for these awards if they plan to pursue a full-time course of studies beyond high school, and are enrolled in or have been accepted for enrollment at an accredited university, college, or technical school. Some of the scholarships require the holding of at least an FCC GENERAL class license or equivalent. The awards range from \$500 to \$2000, with preference given in some cases to residents of specified geographical areas, or the pursuit of certain study programs.

NOTE: The three scholarships from the West Allis Radio Amateur Club (The Emil Kumershek Memorial Scholarships) are available to Wisconsin Amateurs only.

Additional information and an application form can be requested by letter or QSL card, postmarked prior to May 31, 1990, from:

FAR Scholarships  
6903 Rhode Island Avenue  
College Park, MD 20740.

The Foundation for Amateur Radio, incorporated in the District of Columbia, is an exempt organization under Section 501(c)(3) of the Internal Revenue Code of 1954. It is devoted exclusively to promoting the interests of Amateur Radio, and those scientific, literary, and educational pursuits that advance the purpose of the Amateur Radio Service.



# The Captain and the King

By Ero Erickson, KA9DYS  
4024 North Pioneer Street, Chicago, IL 60634

Have you ever met and talked to anyone who knew a real king, a ruling monarch, on a friendly basis? Unfortunately, my mentor on kings became a silent key recently, after a distinguished career in seamanship, and having been part of an event known the world over.

Back in 1953, I had lunch with Captain Kurt Carlsen at the Chicago Yacht Club, who related stories about the royal treatment he received when he sailed to the Persian Gulf. He was invited to visit a king's palace. Most of the world is not aware that King Hussein I of Jordan (since 1953) is also an amateur radio operator, licensed as JY1.

Captain "Stay Put" Carlsen got acquainted with King Hussein via ham radio while in command of the "SS Flying Enterprise". His powerful equipments (1 Kilowatt) were licensed under the call letter W2ZXM/MM. The "MM" means Maritime Mobile.

Captain Carlsen became famous in 1952, when his ship developed a sharp list to the port side in a howling gale in the English Channel. He ordered the crew and passengers to abandon ship, but he remained aboard to keep the property from becoming salvage. He hung on for ten days during attempts to tow the disabled vessel while the seas moderated. However, the storm intensified, and it became obvious that it would capsize. Carlsen jumped overboard and was picked up, ending his "stay put" effort. The term "stay put" was coined by the British press, who titled him as "Stay Put" Carlsen. The whole event was covered daily by television on all newscasts and specials. Everyone knew about Carlsen.

Captain Henrik Kurt Carlsen, worked on another ship while the Isbrantsen Line built a new ship, the "Flying Enterprise II". When he sailed to Chicago via the Great Lakes, and docked at the Navy Pier (where cargo ships are no longer allowed), he was in charge of a replacement vessel. When visiting, I tagged along with a Chicago Tribune reporter and photographer at the suggestion of the day editor, Mr. George Schreiber (W9YIX).

I asked Captain Carlsen what the large box in his stateroom was for. He said he had picked up a TV parts kit at the Heathkit radio store, which he would assemble during long ocean voyages.

He also stated that he had a commercial radio operators' license, as well as mate's papers, and that at one time he had held a job as a combination Second Mate and wireless operator. In distress situations, he had used his Amateur Radio equipment to transmit medical messages, as well as to make emergency contact with rescue vessels when his ship was sinking. He used a battery operated set, and strung up a temporary antenna on the final voyage of the first "Flying Enterprise" to keep in touch. Under normal conditions, his kilowatt transmitter fed a ten meter beam, which worked the world.



**MEET THE AUTHOR:** At the January 30, 1990, Chicago Quarter Century Wireless Association chapter dinner, which featured K9AJ of the Kingman Reef/Palmyra Atoll 1988 DXpedition, Ero Erickson, KA9DYS (above, the author of "A Captain and a King"), saw a painting of the SS North American, on which he was one of the wireless operators over 40 years ago. The painting brought fond memories of a ship which sank in the Atlantic Ocean while being towed to Baltimore to be used for training. The sister ship, the "South", is still afloat, but is in poor shape.

The Chicago radio amateurs all were excited about W2ZXM/MM coming to town. The SRO (Society Radio Operators) had a special meeting to welcome him to Chicago (the meeting was coordinated by "Ike" Ichorst, W9RUK, who was in daily contact with the ship traveling the Great Lakes). Mrs. Carlsen came from Woodbridge, N.J. to take part. She sometimes accompanied the captain on long voyages.

One of the stories Captain Carlsen told was about a ham radio contact he made from the ship with King Hussein. The king invited him to visit his castle when in port, probably in Saudi Arabia, to which he agreed. On arrival, a large Cadillac came down to the dock to the ship's gangway, followed by an entourage, that took Captain Carlsen and his daughter to enjoy what amounted to a real life fantasy land, comparable to Disney World.

One disturbing aspect of the attitude of present day kids is the notion that there's nothing exciting in Amateur Radio, and that it is all dull stuff on FCC rules and learning the code. Kurt Carlsen, who died at the age of 75, didn't seem to think so. After all, he was a radio man who became a seagoing captain, and traveled the world the "old fashioned" way. That beats television for excitement - any day!

## Northern Wisconsin Radio Club

—Since 1923—

Steve Kraft, KE9RW  
Secretary  
Rt. 7, Box 62  
Menomonie, WI. 54751

The last meeting of the Northern Wisconsin Radio Club was not held, due to inclement weather. The next meeting will be on March 27, at the Peppermill Restaurant in Menomonie. Ernie, WØLUY, and his wife, Delores, will offer a program on Blue Birds. The meeting starts at 7:30 p.m.

## Attention Young Artists

If you are between the ages of 8 and 18, and have an interest in electronics, the American Radio Relay League (ARRL) would like to showcase your artistic talent and originality. The ARRL is sponsoring a national art contest, with the theme "Youth in Amateur Radio." Winning entries will run in QST. Some entries will also be forwarded to the "Youth in the Electronic Age" worldwide contest, sponsored by the International Telecommunications Union in Geneva, Switzerland.

For a copy of the rules, send an SASE to ARRL, Educational Activities Branch, 225 Main St., Newington, CT 06111. The

deadline is April 15, 1990, so contact the League right now!

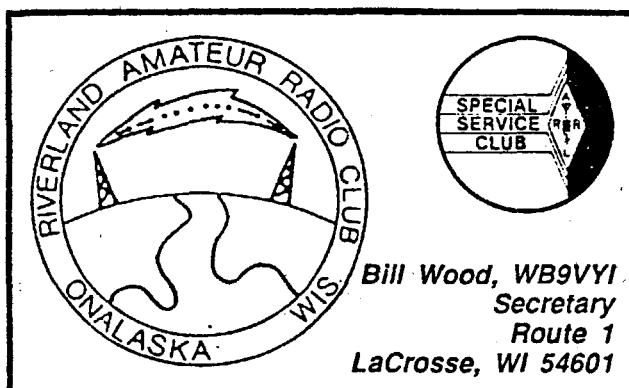
— The ARRL Letter, 02/14/90

## Help Wanted

An advertising salesperson is needed by Badger State Smoke Signals. This is not a "job" as such; it's something for part time or spare time. A small commission is paid, as are certain expenses.

If you have some time on your hands and like a challenge, contact BSSS Chairman Kenneth A. Ebner, K9EN, 822 Wauona Trail, Portage, WI 53901, or call Ken at (608) 742-3560.





**Bill Wood, WB9VYI**  
Secretary  
Route 1  
LaCrosse, WI 54601

Our president, Dick Low, KØJYB, called the regular monthly meeting to order at 7:30 p.m., Feb. 6, 1990, at the Onalaska Civic Center. He called for the reading of the minutes.

After the minutes were read, Kent Helman, W9LZQ, noted his name was read off, but he wasn't there. Charlie Burch, KA9UUK, motioned to strike his name from the report, and let the rest of that section remain as is. Van Elston, WA9FIO, seconded. All agreed, and the report then stood as presented.

Arby Boomer, WF9T, then shared the treasurer's report. He called our attention to the ARRL rebate plan that is well worth taking advantage of. His report was accepted as read.

Dick announced the various committees:

Van Elston, WA9FIO, and Dan McKenzie, WCØV, Repeater Committee;

George Kroner, KE9PL, Publicity Committee;

Larry Kapp, N9JFI, Education Committee;

Scotty Neader, KA9FOX, Field Day Committee;

Walter Altus, WD9GCR, Swapfest Committee; and

Rick Williams, KV9U, VE Testing.

As of yet, we do not have a program chairman.

After our next meeting, we will be having a mini-swapfest. We will start the meeting promptly at 7:00 to allow for the extra time we will want. Walter Altus sought the club's approval for mailing out notices to those not at the meeting tonight. Charlie moved to appropriate \$25.00 for the postage. John Jorenby, KA9ETH, seconded it, and it passed unanimously.

Dick reported and passed out sheets listing the club's equipment. Van also put together a list for us.

More discussion was had as pertains to a club station and some of the other possibilities.

Charlie brought the new constitution and by-laws. He also presented forms to use for the next balloting, voting, etc.

Van gave us a report on a conference being put together by the RiverLan group. This is the amateur packet radio group from the LaCrosse/Winona/Tri-State area. They are putting on a packet conference on April 14 at Nob Hill, starting at 10:00. Coffee and rolls will be served at 9:30. The theme is emergency communications. Fred Wendt, W9ZAG, Wisconsin Section

Emergency Coordinator, will give this perspective on this issue. The newly appointed District Emergency Coordinator, Kent Helman, W9LZQ, will be there. Jim Boos, WB9YSG, active with the weather service, will be discussing these communications during bad weather, and in connection with the National Weather Service.

There will be a technical program in the afternoon, "The \$50.00 Way to Get into Packet Radio with Digi-Com 3.51." At the same time, for those who have other interests, Mr. Steve Thompson, of our National Weather Service office, will do SkyWarn training, and have a video on flash flooding. There will be other events to follow, and can be found by checking into the local bulletin board.

Walter motioned to reconsider the dues raising to \$20.00. Charlie seconded this motion, and discussion was had. It seems the club is well enough off, so Charlie moved, and Rick seconded, the motion to keep the dues at \$15.00. Motion passed.

Last month, we read and discussed two members' letters of resignation, those of Tom Speropulos and Craig Goldbeck. Our general attitude was that we did not want to accept the letters, hoping they would change their minds. Since the meeting, several have talked to these men, and came back reporting there would be no changes, at least at this time. I made the motion to accept these letters. Charlie seconded it, and the club approved.

Rick presented a V.E. report. On Thursday, May 17th, here at the Civic Center, we will be having Amateur Radio examinations.

Karl Simonson worked with Larry on the potential club station options, and presented a good list of possibilities for us to be considering.

Dick said he would be trying to have the board meetings each Saturday just prior to our regular club meetings.

Mike Hoier, KA9PSL, from Tomah, a member of A.P.C.O., gave us some infor-

mation about their North Central Regional Conference, running May 14 - 16 here in LaCrosse, at the Island Inn. Mike said there would be some early arrivals coming Sunday the 13th, and sought our help via radio communications with directions, etc.

Nook Benson, K9EGO, moved to adjourn; Charlie seconded it, and all were in favor.

Respectfully submitted:

Bill Wood, Secretary, R.A.R.C.

#### MEMBERS AND GUESTS PRESENT

Duane Fruechte	W9HWQ
Karl Simonson	
John Kass	WA9IZY
Joe Mezera	WA9SOQ
Phil Uehling	W9UP
Tom Gromacki	KB9BIS
Rick Williams	KV9U
Wid Johnson	W9DM
Maty Johnson	XYL/W9DM
Greg A. Miller	KA9FOZ
Dean Summers	KQØC
Val Elston	WA9FIO
Dan Iverson	
John Jorenby	KA9ETH
Mike Hoier	KA9PSL
George Kroner	KE9PL
Arby Boomer	WF9T
Charlie Burch	KA9UUK
Walt Altus	WD9GCR
L. F. Bentzen	K9EGO
Ron Reed	KD9OY
Ken Weigel	
Kent Helman	W9LZQ
Scott Neader	KA9FOX
Gary Webb	N19V
Feroz Ghose	N9FJL
Roger Reader	KA9BBK
Larry Kapp	N9JFI
Hugh Barker	KAØEJZ
Bill Wood	WB9VYI
Dick Low	KØJYB

## FCC QSLs: QSY or QRT

Over 240 United States hams who broke the rules trying to contact the January Bouvet Island DXpedition have been cited for making phone transmissions on frequencies not authorized for that mode.

Those cited were accused of having violated Section 97.305(c) of the amateur rules. All of the Notices of Apparent Violation were for the calendar period January 6-13, but this may be only the beginning of the enforcement effort. Still to be dealt with are the numerous "channel cops" who decided on their own to direct the operation, and a large number of apparently frustrated operators who took to jamming and catcalling antics to vent their anger.

While both groups may have hoped that

their failure to identify to identify might have saved them from a pink slip, this may not be the case. The Washington rumor mill says that a number of these stations have already been found, and that their Notices of Violation may be for malicious interference, failure to properly identify, and use of foul language, in addition to the basic out-of-band operation charge.

This is believed to be the largest single crackdown on Part 97 violators in the history of the Amateur Radio Service. Some knowledgeable sources say that over a thousand hams may receive unexpected FCC QSLs before the activities in this matter taper down.

- Westlink Report,  
02/16/90



## FCC Proposes to Add Communicator, Simplify License Structure in PR Docket 90-55

On February 8, 1990, the Federal Communications Commission (FCC) decided to propose a codeless class of amateur operator license, called Communicator.

The Communicator Class would be incorporated into a licensing structure containing four ascending classes: Communicator, General, Advanced, and Amateur Extra. Current Novice and Technician Class licensees would be grandfathered indefinitely, but no new licenses for those classes would be issued.

According to the FCC news release announcing this decision, the Communicator Class license would satisfy three major objectives: First, to offer an entry level license for all persons who find telegraphy a barrier to pursuing the purpose of the amateur service; second, to design a codeless license that can easily be implemented into the current licensing process; and third, to avoid any negative effect upon current licensees, the volunteer examiners who administer amateur examinations, or the Commission's workload.

It appears that the FCC is proposing two versions of the Communicator Class. The first would not require knowledge of Morse code. The "codeless Communicator" would be permitted to operate on the 220 MHz and higher amateur bands. A Communicator Class licensee passing or receiving credit for a telegraphy examination would be authorized the privileges of the current Technician Class. Applicants for the new Communicator Class would be required to pass a 60 question written examination comprised of questions from the two pools currently used in the Novice and Technician license examinations, as well as additional new questions.

The proposed transmitter power for the Communicator Class is 200 watts PEP. All emission types would be permitted. Call signs for Communicators would be issued from group D.

Upon initial review, American Radio Relay League Executive Vice President David Sumner, K1ZZ, commented, "The FCC proposal differs in one very major respect from the League's petition, RM-6995: the Commission proposes to stop issuing Novice licenses so that the one point of entry into Amateur Radio would be Communicator. This differs substantially in philosophy from what we have envisioned.

"While the League will not have an official position on the FCC proposal until one is adopted by the Executive Committee or the Board, it is fair to say that we have long placed great importance on the retention of the Novice license as a means of entry into Amateur Radio. It would not be overstating the past and present League position to say that retention of the Novice license is deemed absolutely essential." However, Sumner cautioned that amateurs should wait until they have an opportunity to study the Notice of Proposed Rule Making before forming opinions on the Commission's proposal. The NPRM is to be released around the time this issue of *Badger State Smoke Signals* is mailed.

The Commission is requesting comments on all aspects of this proposal. There will be a comment period of six months, beginning on the date it is published in the Federal Register. This will be followed by a one month period for reply comments.

- The ARRL Letter, 2/14/90

## Third Party Agreement Countries List

Section 97.115 of FCC rules authorizes an amateur station licensed by the FCC to transmit messages for a third party to any amateur station within the jurisdiction of a foreign government whose administration has made arrangements with the United States to allow amateur stations to be used for transmitting international communications on behalf of third parties.

Here are the countries that have made the necessary arrangements with the U.S. to permit third-party messages (recently added countries are underlined): Antigua and Barbuda, Argentina, Australia, Belize, Bolivia, Brazil, Canada, Chile, Colombia, Federal Islamic Republic of Comoros, Costa Rica, Cuba, Dominica, Dominican Re-

public, Ecuador, El Salvador, The Gambia, Ghana, Grenada, Guatemala, Guyana, Haiti, Honduras, Israel, Jamaica, Jordan, Liberia, Mexico, Federated States of Micronesia, Nicaragua, Panama, Paraguay, Peru, St. Christopher and Nevis, St. Lucia, St. Vincent and the Grenadines, Sierra Leone, Swaziland, Trinidad and Tobago, United Kingdom (special event stations with call sign prefix GB followed by a number other than 3), Uruguay, and Venezuela.

United Nations station 4U1ITU in Geneva, Switzerland and 4U1VIC in Vienna, Austria, have also made arrangements with the U.S. to permit third-party communications.

No amateur station regulated by the FCC shall transmit messages for a third party to any stations within the jurisdiction of any foreign government not listed above. This prohibition does not apply to a message for any third party who is eligible to be the control operator of the station.

- The ARRL Letter, 02/14/90

## The 3905 Century Club

A quick and easy way to collect lots of QSL cards, plus get CW practise, is to check into one or more of the nets operated by the "3905 Century Club Inc". The sole purpose of these nets is to provide opportunities to make contacts. Net control calls each station that has checked in, giving each the opportunity to call any other station on the net to exchange signal reports. Any ham is encouraged to check in.

Because it is possible to collect large numbers of QSL cards on the net, they operate their own QSL bureau, which anyone may use. The address is: Carol McClure, N5GAP, 3428 Kilrush Dr., Arlington TX 76014.

The club also has an elaborate award program for those who enjoy using their net contacts for that purpose. The first award, which must be earned before being eligible for any others, is 100 points by the following:

Contact with a state capital - 10 points;

Contact with a DX station - 5 points;

Contact with a YL or XYL - 5 points;

Contact with a combination of two hams in a single household - 10 points; and

Contact with a 1 or 2 letter suffix call - 5 points.

The CW net schedule is at 8 p.m. local time: Monday night on 80 meters (3.680 MHz), and Wednesday and Saturday on 40 meters (7.035 MHz).

Net control starts by calling CQ a few times, giving the net name, and opening it for stations to QNI (report into the net). You are welcome to check in at any time during the net by simply breaking with QNI and your call. When you check in, just give your name and state (plus the 2nd ham's name and call if a combination). The first time you check in, no doubt most of the others will want to contact you, as there has been only one Wisconsin station on the net lately. And, everyone wants to contact a new station.

Because of the award system, YLs, those hams with one or two letter suffix calls, and combination stations will be especially in demand. Unlike other nets, you may leave at any time but, out of courtesy to others, you should inform net control you are going QNX (Request permission to leave the net/You may leave the net).

Sideband nets are held daily on 3.905 MHz, from which the 3905 Century Club gets its name.

- Via Sid Vaughn, NØDJJ  
Mount Vernon, IA

## The Communicator

"The Communicator" (Greater Taylor County area) does not appear this month. No material for publication was received.



## ARRL Board

(Continued from front page)

the first time in nine years, and in recognition of the 50% inflation that has occurred since then, as well the need to maintain adequate financial reserves for future challenges to Amateur Radio privileges, the Board adopted an increase in ARRL dues. Effective April 1, the regular annual dues rate will go from \$25 to \$30. The senior-citizen rate will go from \$20 to \$24, and youth rates will also increase 20%. The special rate for family members and blind members will increase by \$2, to \$4.

Larry Price, W4RA, was reelected as ARRL President. Also reelected were James McCobb, K1LLU, as Treasurer, and David Sumner, K1ZZ, as Executive Vice President and Secretary. There was some realignment of League Vice Presidents, with George Wilson, W4OYI, elected as First Vice President. Additional Vice Presidents elected were Rod Stafford, KB6ZV, and Jim Haynie, WB5JBP. Jay Holladay, W6EJJ, was elected International Affairs Vice President. Tod Olson, K0TO, retired from the Board after 16 years of service as Vice Director, Director, and President.

The Board recognized the long service of Chuck Bender, W1WPR, and Laird Campbell, W1CUT, who recently retired from the ARRL Headquarters staff.

Elected to the Executive Committee for 1990 were Directors Butler, W4RH, Mendelsohn, WA2DHF, Quiat, AG0X, and Turnbull, W3ABC. President Price, Vice President Wilson, and Executive Vice President Sumner also serve on the Executive Committee.

In other actions, the Board reaffirmed its earlier position opposing a reduction in AM power privileges scheduled to take effect later this year, and renewed its instruction that a way be found for new club station licenses to be issued, and for the holders of expired call signs to reobtain them. A field organization station appointment, Local Government Liaison, was created to better represent Amateur Radio interests at the local level. Endorsements to the 5-Band DXCC Award for 17 meters and 12 meters were approved; application details will be announced later. Studies of a number of issues and proposals were ordered by various committees and the staff.

The complete Minutes of the meeting will appear in March QST.

- The ARRL Letter, 01/29/90

## Eau Claire Amateur Radio Club

Carl Searing, W9NW  
Secretary  
1129 McKinley Road  
Eau Claire, WI. 54703

### REPORT ON MEETING OF 13 FEBRUARY, 1990

The meeting was opened at 7:30 p.m. by President Bill Jablonske, W9NNS. Secretary's and Treasurer's reports were read and approved.

After a roll call of the 31 members and guests present, the upcoming hamfest was the topic of discussion. Don Alm, K9-UXP, brought in a stack of the new hamfest flyers. Members were urged to take quantities of them to hamfests that they may attend and to pass them out. Due to crowding at the last 'fest, arrangements have been made to rent an additional building this year.

Andy Anderson, KA9HWN, was elected a Director of the club, replacing Jim Wis-kow, KE9BC.

A recommendation to nominate a local amateur to serve as the area Emergency Coordinator was discussed at some length.

There has not been a local EC for three years. The membership decided to maintain the status quo, feeling that the local Skywarn organization serves our emergency needs adequately.

W9NNS reported on the Packet Radio node situation, stressing present and possible links to major urban areas from Eau Claire, and the problems inherent in maintaining consistency of operations. An appeal was made for funds to assist in the relocation of N9BOE's Packet node CMY in the Tomah area. A check will be sent to N9BOE.

Roger Halmstad, K9YYG (SM5KYY), talked briefly about the Amateur Radio scene in Sweden, where he has resided for some 13 years. He has returned to our area for a three month period of work with Cray Research, and was warmly welcomed.

Andy, KA9HWN, talked about plans for the continued upgrading of the club trailer, with emphasis on work parties, the main aim being to make the unit ready for Field Day.

After the meeting adjourned at 8:43, W9NNS held forth at some length to interested parties on the subject of Packet Radio, wielding chalk to good effect.

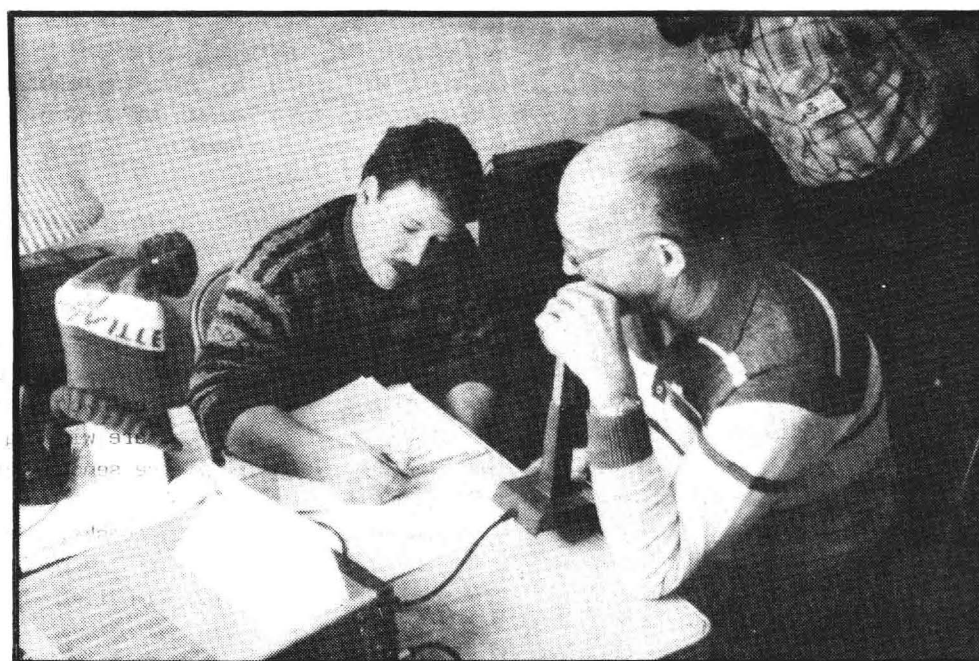
Lunch Committee for the next meeting: KA9HWN, W9ZZI, and W9NNS.

Carl Searing, W9NW, Secretary

## FLARC Special Event Station Tallies 750 Contacts

Operating Special Event Station W9JZ from Sun Prairie, WI on February 2 and 3, in observance of Ground Hog Day, were Peter Quigley, KB9-ASQ, and Don Liedl, WB9OQX.

- Photo  
courtesy FLARC



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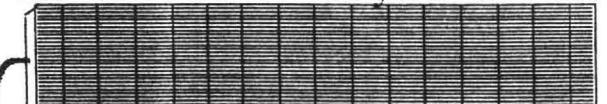
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:-----:

There is no charge for ads in SSB. Please send your ad to Ken Ebnetter, K9EN, or Jim Romelfanger, K9ZZ, addresses page 2.

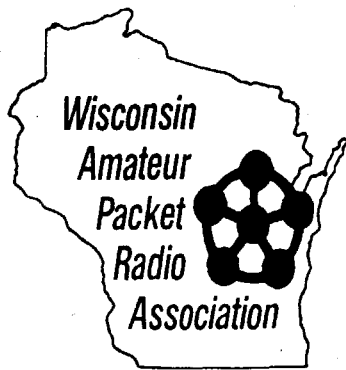
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# THE WISCONSIN PACKETEER

Wisconsin Amateur Packet Radio Association (WAPR)

c/o CARL SCHUMACHER, N9BYS  
7740 EVERGREEN TERRACE  
BURLINGTON, WI 53106

Steve Loeffler, WB9ZRE, Editor, 123 W. Oshkosh St., Ripon, WI 54971

WISCONSIN AMATEUR PACKET RADIO ASSOCIATION

Membership meeting January 13, 1990

THE NETWORKING CHALLENGE

INTRODUCTION TO PACKET - PART 2

## MINUTES

Minutes of the meeting of the Wisconsin Amateur Packet Radio Association held on this date at the WARAC Swapfest, Waukesha, Wisconsin. The meeting was called to order at 10:41 am by Vice-Chairman Roy Hawkins, WA9KEC. Twenty persons were present.

The minutes of the last meeting were not available but had been published in the WAPR section of Badger State Smoke Signals. Treasurer Carl Schumacher, N9BYS, reported a balance of \$969.62. The treasurer's report was accepted as read.

Roy reported that five 4800 baud HAPN modems have been purchased by WAPR for use in backbone links at Markesan, Madison, and Slinger, with two held in reserve for future use.

Wally Dieter, N9CLE, reported that there was a potential node site at Medford. The possibility of a node at Rice Lake was also reported.

Roy suggested the need for a network coordinator for Wisconsin and asked for a volunteer for the position. Bill Jablonske, W9NNS, expressed interest in performing this function.

Roy reported on the unusability of the LAN frequencies in the Milwaukee area by operators due to the large amount of forwarding between PBBSs on those channels during prime time. He stated the need for PBBS forwarding to occur on non-LAN frequencies, preferably on high speed channels, and, at least, that no forwarding occur on LANs between 6:00 pm and 12:00 midnight as it was adversely affecting the ability of operators to use the LAN channels.

The problem of operators to find a path from the Northern parts of the State to the Southeast was mentioned. It was suggested that the disappearance of nodes or digipeaters on 145.01 in the Southeastern part of the State was the cause of the problem. Roy said that he would put one of his ports back on 145.01 and see if that would help as an interim measure.

Fred Wendt, W9ZAG, Wisconsin Section Emergency Coordinator, and Jim Boos, WB9YSG, spoke on ARES use of packet for severe weather reporting.

A motion was made and seconded that the secretary send a letter to former Chairman Dan Bolander, WB9TYT, thanking him for his outstanding service to packet radio and to WAPR. The motion was passed unanimously.

The meeting was adjourned at 11:31 am.

Respectfully submitted,  
Dave Knaus, WA9POV, Secretary

Where can you get without a map? Even a jaunt across the state these days requires some help. And if your travel is by packet, where can your trip take you?

The fact is that we are not totally sure today, because our information is not up to date. So WAPR will make an effort to update the NODES and DIGIS list.

If you have been listening to packet frequencies lately, you are aware that there has been a lot of growth in the Northern and Northwestern part of the State. In fact, among several passionate issues, everyone seems agreed that we need an East-West link from Green Bay to Minneapolis. We also need a path North-South to link Superior-Duluth to La Crosse and Milwaukee.

Here is a challenge to clubs and individual hams:

First, help us draw a new map of NODES and DIGIS by sending us all pertinent information on any system in your area, including its power, antenna height above ground, and operating software and frequency that is (or could be) dedicated exclusively to packet networking. Indicate if it is now in operation and on what frequency and the callsign.

WE NEED INFORMATION ON EVERY AREA OF THE STATE representing all phases of amateur packet activity such as Packet-Cluster, Converse, weather net or whatever.

Secondly, we need to hear from hams who would be willing to become part of an effort, even at their own expense, to put nodes on the air in locations to be determined so that ALL the areas of this state can get linked to the network and have access to each other, to bulletin boards and to the great world of packet activity.

If you are willing to be part of this major effort, please send a card to,

Bill Jablonske, W9NNS  
810 Pearl Street  
Chippewa Falls, WI 54729

Bill will send you a questionnaire. Please do it today. Immediate action can get us an improved system in a big hurry. Let's make this a real showpiece of cooperation!

The obvious duty of the net control is to be so infernally dull that the check-ins will appear brilliant by contrast.

A great QSO is the art of speaking briefly.  
--WACCT

THE NITTY GRITTY OF THE TNC AND PACKETS.

## WHAT THE TNC DOES

The TNC consists of a special purpose micro-computer, containing all the necessary software and hardware to communicate with your terminal, assemble a packet, operate your transmitter and receiver to send and receive a packet, and decode a packet. The special functions of the TNC which would be difficult to implement with an ordinary personal computer are the use of protocol to communicate with other TNCs and real-time control.

The encoding and decoding of packets involves a carefully standardized set of procedures called a "protocol". The protocol basically determines the exact form of the header and tail parts of the packet. The header allows receiving TNCs to automatically determine the purpose of the packet, e.g., net check-in, part of a QSO, or ACK to a previous transmission. The tail contains the FCS, which allows the TNC to automatically determine whether the packet was received correctly, and if so, to automatically acknowledge it. Since the protocol is programmed into the TNC, the operator does not need to know exactly what his packet "looks" like. In particular, he does not need to know how the destination of his packet is indicated. The operator communicates with other amateurs by call sign, and the TNC translates the call sign into the identification required by the protocol.

The TNC is required to perform a number of tasks simultaneously, including responding to events such as the receipt of a packet or instructions from the operator in "real time", in other words, as they happen. This makes programming in BASIC, the common language of personal computers, undesirable. This is because BASIC uses an "interpreter" which reads each line of the program and translates it into machine-type instructions every time the line is executed. The time required for the translation would prevent a program from responding rapidly enough in a packet radio environment. In order to meet the speed requirement, an assembly-language program or equivalent is required. While BASIC looks pretty much the same on any computer, assembly language is different for every machine. If the TNC were replaced by personal computers, program development would have to be redone for each variety of computer. In addition to maintaining the right pace, the TNC also must be constantly "listening" at both ports simultaneously while putting packets together or taking them apart.



The hardware of personal computers may not even be capable of this sort of multi-tasking application.

Programming of individual TNCs must be as easy as possible, since there will inevitably be unforeseen problems in the initial software. In addition, hardware changes may necessitate software changes. For this reason, TNCs are designed around erasable programmable read-only memories (EPROMs), which normally function like the ROM of a personal computer, where the vital software is stored in an indestructible form. However, if the need arises, they can be reprogrammed by "burning in" the new program using special equipment.

## WHAT IS A PACKET?

A packet is the basic message unit in packet radio. It ordinarily consists of a text message typed in by the operator, sandwiched between the header and tail information required by the protocol. In a typical QSO, a packet would be encoded and sent out by the TNC when the operator ends a line of typing by hitting the RETURN or ENTER key. In any event, the length of a packet is limited, usually to 128 characters. This helps to prevent a single user from "hogging" the channel, as well as making sure that the sending and receiving TNCs don't get swamped with information.

A packet need not consist of ASCII or Baudot character strings, however. It could contain information in other coding systems, such as BCD or EBCDIC, or even binary data such as a compiled computer program. The TNC, which uses a "bit oriented protocol" based on a standard called High Level Data Link Control (HDLC), can encode any of these equally easily. An advantage to this choice of protocol is that the functions it requires are available on a single large-scale integration (LSI) chip, which simplifies the TNC hardware and software. A second advantage of HDLC protocol is that the beginning and end of the entire message are flagged, making the "start" and "stop" bits for each character unnecessary

when the packet is transmitted in "synchronous" format.

The "frame" of an HDLC is represented below. Each field of the packet is encoded as a sequence of 1s and 0s (bits) to be transmitted as "mark" and "space" tones. With the exception of the DATA field, all these fields are generated by the TNC as it assembles the packet for transmission. The operator is concerned only with the contents of the DATA field.

```
-----
| FLAG | ADDRESS | CONTROL | DATA | FCS | FLAG |
-----
```

Next month,  
NETWORKS AND THE FUTURE OF PACKET RADIO.

## TOMAH NODE CHANGE

During the process of updating the Tomah Node, the Call sign and alias have been changed temporarily. The temporary Call sign is W9LZQ-2 and the Alias is LZQ2. If you are trying to connect between WILSE and WINFR or WILSE and WISTE, you will have to use the changed call.

The system is operating on borrowed equipment at the present time. We expect that the call sign will be changed back to N9BOE-1/CMY as soon as the permanent equipment can be installed in approximately 4-6 weeks. We will advise as soon as it is back to normal. Sorry for the inconvenience. Thanks to those of you who have contributed financially to this upgrade.

73, Kent W9LZQ @ W9LZQ

## ADVANCED PACKET PRESENTATION

The Rock River Radio Club (of Dodge County) cordially invites you to our March 6th meeting. The program will be ADVANCED PACKET RADIO. Our guest speaker will be Rudy Hilsmann (KB9OK) of Germantown. Rudy's packet operations include several nodes (WIGER and WIGTN), a gateway and a

converse node (GTCONV). Everyone is welcome at the RRRC meetings, so feel free to bring your friends. The meeting begins at 7:30 PM. We meet in the lower level conference room at the Dodge County Sheriff's Department, 141 N. Main Street in Juneau. We hope to CU there!

## UPGRADES AT THE SLINGER NODES

This has been an interesting week for the WB9TYT nodes on the hill in Slinger, WI. First the G-7 for the 145.69 port bent in the middle & finally fell apart on Wednesday, January 31, 1990. The WISLG node stayed on the air with the stub of the G-7 acting as a 1/4 wave antenna. It's coverage was greatly reduced, however. It has now been replaced with the "beefed-up" spare & should be back to normal. It is running 60 watts to the antenna now & uses 1/2 inch Heliax for feedline.

The 4800 baud, 446.100 port uses 1/2 inch heliax for feedline & a Phelps Dodge 10db statimaster antenna. It was covered with ice on the Northeast side of the antenna. I shook as much loose as I could while I was up on the tower.

I also added another 220 port to the matrix. It is on 221.315 Mhz & is using a 4 element Cushcraft beam pointed at Milwaukee. The Beam is 1/2 way up the tower to give it some separation from the 223.420 node. Hopefully all the 220 users in Milwaukee area can use this frequency to access the nodes to allow the WB9TYT-9 (#slg2) node to move traffic to Madison & Markesan nodes. The call of the 221.315 node is WB9TYT-5 (SLGH).

The fifth node on the matrix is the WB9TYT-6 (WICONV) node. It does not have a radio connected to it & must be accessed via another node. It is a converse node & allows multiple users to stay connected & chat in a round-table type setting. It has 255 separate channels in it.

I hope I did not inconvenience anybody as I had all the nodes down most of this beautiful Sunday afternoon. All are up & running now & feel free to comment on their coverage, etc. If there is anything else I can do to help, feel free to ask...

73 es Cul, Dan, WB9TYT....

☐

## Wisconsin Amateur Packet Radio

☐

## Membership Application

Name: \_\_\_\_\_ Call: \_\_\_\_\_ Home Phone: \_\_\_\_\_

Address: \_\_\_\_\_ City: \_\_\_\_\_ State: \_\_\_\_\_ Zip: \_\_\_\_\_

Home BBS: \_\_\_\_\_ Monitor Freq.: \_\_\_\_\_ Hours of Operation: Day: ☐ Night: ☐ 24 Hour: ☐

Station: Power: \_\_\_\_\_ Ant. Gain: \_\_\_\_\_ Height: \_\_\_\_\_ TNC: \_\_\_\_\_ Computer: \_\_\_\_\_

Station Capabilities: HF: ☐ 2M: ☐ 220 MHz: ☐ 440 MHz: ☐ Other: \_\_\_\_\_

I operate a Digipeater: ☐ Alias: \_\_\_\_\_ Packet BBS: ☐ Software Used: \_\_\_\_\_

Primary Interest in Packet: \_\_\_\_\_

Please return this form, COMPLETED, with your check or money order for \$ 12.50 to:

Carl Schumacher, N9BYS, 7740 Evergreen Street, Burlington, WI 53105



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WANTED: HF rig (TS-830, 430, etc.), Bencher iambic paddle. Send description and price o KA9FOX, Scott Neader, 629 King St., La Crosse, WI 54601.

XYL explaining the OM: He gets lost in thought as it is new territory for him.

# Yellow Thunder Amateur Radio Club



**K90DK  
WB9FDZ**

**Art Kleefisch, W9WSS  
Secretary  
1014 5th Street  
Baraboo, WI. 53913**

The next meeting of the Yellow Thunder Amateur Radio Club will be held in room 12 of the Baraboo Civic Center on Thursday, March 15, 1990. The meeting will follow the Novice Class, and the program will be related to the Novice Class.

At the February 14 Meeting, there was no quorum present at the start of the meeting, so no business was conducted during the meeting.

The following members and guests were present:

Duane Grotophorst, KA9HKL	Loganville
Harold Reif, KA9YQP	Baraboo
Dennis Sweeney	Portage
Joey Sweeney	Portage
Art Kleefisch, W9WSS	Baraboo
Jim Decker, WB9UQT	Baraboo
Harry Westlund, K9EHJ	Baraboo

The novice classes are going well with 18 students starting the class.

The program on Microbiology scheduled to be presented by Dennis Sweeney, was postponed until the April meeting.

## YTARC BIRTHDAZE

Art Escher	WA9WUS	March	12
Fred Becker	W9KKM	March	17

## SENTENCE SERMON

We often pray for purity, unselfishness, for the highest qualities of character, and forget that these things must be earned.

--Lyman Abbott

## MENOMONIE, WI (ARRL-VEC)

March 31 and November 3, 1990

Credit Union Bldg., 444 S. Broadway, Menomonie, WI. Contact: Dr. T. King, WF9I, 108 Shorewood Dr., Menomonie, WI 54751. (715) 235-5757.

## EAU CLAIRE, WI

Tests will be given on the following dates: April 14, July 13 and 14, and September 13, 1990

The April and September examinations will be given at the Facilities Management Building, The University of Wisconsin, Eau Claire Campus. The July Examinations will be held in conjunction with our Hamfest at the Eau Claire Junior Fair Grounds.

## MADISON WI - ARRL/VEC

April 7 (MARA swapfest).

All exams will be held at Fire Station No. 2, 421 Grand Canyon Dr., with the exception of the April 7 date, which will be announced later.

## RACINE, WISCONSIN - ARRL/VEC

Monthly - first Saturday, except January, July, and August.

Exams are given at the Red Cross Building, 4521 Taylor Avenue, Racine. Walk-ins are permitted. Inquiries and registrations should be directed to William Firchow, Jr., NW9P, 1912 27th Street, Kenosha, WI 53140, telephone (414) 658-8390.

## Tomahawk, WI

Last Saturday of every month. Jan. thru Oct.

Tomahawk Volunteer Examiners (ARRL/VEC). Tomahawk, WI. No pre-registration required, but appointment would be appreciated. Registration at 8:30 a.m. and testings starts at 9:00 a.m. For location or other information, inquire on 145.43 MHz. repeater or contact: Greg Garner, WA9W, 4088 Highway 51, Harshaw, WI 54529. Telephone (715) 453-7096.

## Loves Park, IL

Third Saturday of every month.

Northern Illinois Volunteer Examiners (DeVry VEC). Held at North Suburban District Library, 6340 North Second St. (Hwy. 251), Loves Park, IL. Contact: Dennis G. Eksten, W9SS, 5006 N. Second St., Loves Park, IL 61111. (815) 877-6768.

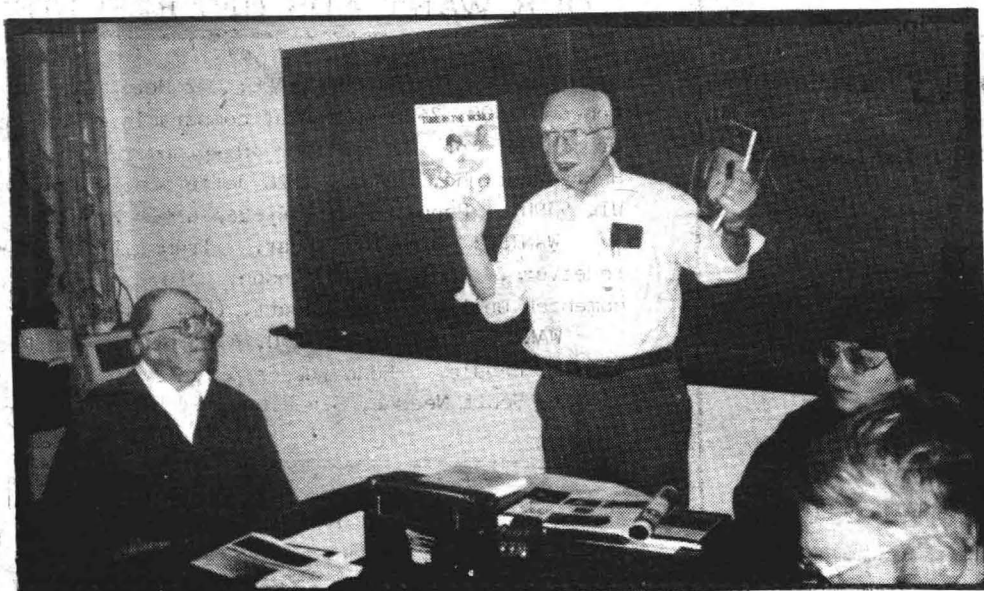
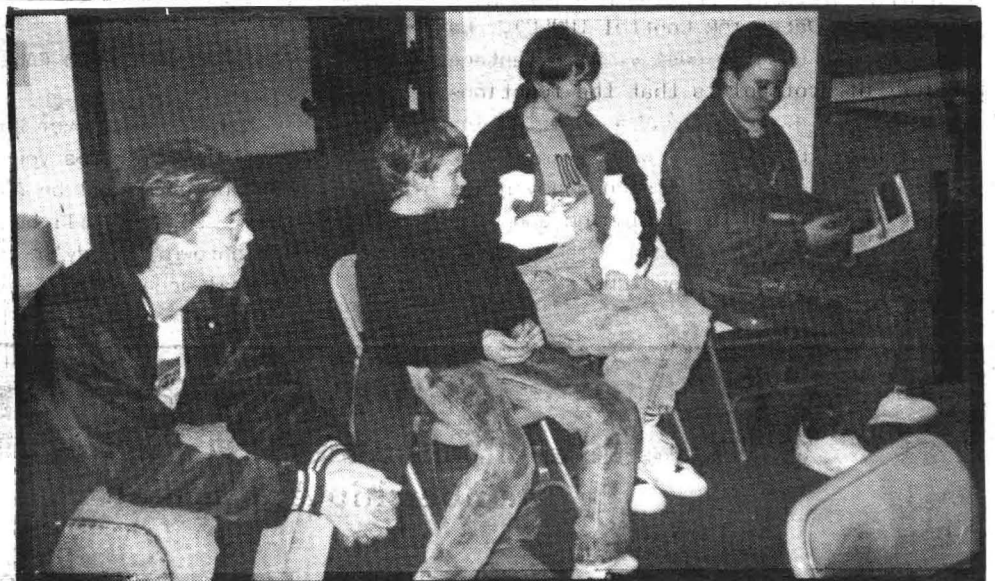
This section of Badger State Smoke Signals is available to publicize your Volunteer Examiner Amateur Radio license examination schedules.

Please send us your schedules of dates, times, and locations that you will be conducting examinations and we will include the information here. Be sure to include contact address and any other necessary requirements. Information should be sent to K9EN at the address shown on page 2.

Right: Students at Novice class.

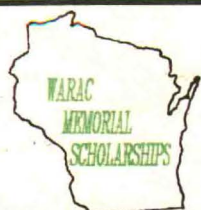
Below: Instructors for the 1990 YTARC novice class.

Photos taken at the YTARC novice classes now being held in the Baraboo Civic center, Baraboo WI.





# The Shopping Center



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## SOUTH MILWAUKEE AMATEUR RADIO CLUB SWAPFEST

July 7, 1990

(Held every July)

American Legion Park  
Shepard Ave. Oak Creek, WI

PO Box 102 Milwaukee, WI 53172

## SWAPFEST 1990

Saturday, May 12  
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Jefferson, WI 53549

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